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LOCAL ANÆSTHESIA FROM THE COLD OF RAPID EVAPORATION AND SPRAY-PRODUCING INSTRUMENTS, FOR THE "PULVERIZATION OF FLUIDS."

By the Editor.

The medical journals of recent date have contained several notices of the production of local anæsthesia for surgical and other purposes, where the avoidance of pain was desirable. According to Dr. Page, (Boston Med. and Surg. Journal, May 24, 1866), the possible use of cold for the production of local anæsthesia was first announced by Dr. James Arnott, of England, in November, 1847, after which Mr. Nunnelly, Prof. Simpson and M. Velpeau, of Paris, (in 1850), had employed it. In the United States, Dr. J. Mason Warren appears to have applied it in removing a nævus at the Massachusetts General Hospital, in June, 1852, and subsequently by other surgeons. The difficulty in employing cold, in a practical manner, so as to continue and regulate it, rendered this method ineligible in many cases.

In 1862, Dr. B. W. Richardson, of London, was attracted to Dr. Arnott's use of cold, and he commenced experimenting with the view of getting a practical means of producing local anæsthesia. As early as 1858, M. Girons exhibited before the Academy of Medicine at Paris, an instrument for atomizing fluids, by means of which the escape of compressed air forced a fine stream of medicated fluid against an oblique metal plate or tube, so as to convert the fluid into fine spray. After this Dr. Bergson, of Berlin, suggested the little instrument known as the Bergson

tube, and which has been so extensively applied as a parlor curiosity for perfuming the atmosphere. This consists of two glass tubes with capillary extremities, so connected together that one is vertical and the other horizontal, their orifices being so arranged in position that a current of air blown through the horizontal tube passes across the extremity of the vertical tube, and causes an upward current by suction. If now the inferior end of the vertical tube be placed in a vial containing an odorous fluid, and a strong current of air be blown through the horizontal tube, the air is drawn out of the former, which causes the fluid to rise to the orifice and, under the influence of the current of air, to be converted into an exceedingly fine spray or mist, which readily mingles with the air and odorizes it. Various other forms of apparatus, involving the principal of the Bergson tube, have been suggested, among which is that of Dr. Siegle, in which a current of steam, at a regulated temperature and pressure, takes the place of air; and that of Dr. Andrew Clark, of London, who uses a gum-elastic tube, attached to the horizontal tube of Bergson's apparatus, and containing two hollow gum-elastic balls, one of which acts as a reservoir for air, and is surrounded by netting to prevent its expansion beyond a certain degree; the other ball is constructed like the ordinary gum syringe ball, with two valves, so that simple compression and release will force a current of air into the upper ball, from which it gradually escapes with a force proportioned to the condensation of the air. By means of these instruments a current of spray or "pulverized fluid" may be directed against any part of the body requiring this form of medication, with the greatest ease, especially to the eyes, ears, gums, etc. It has long been well known that rapid evaporation produces a reduction of temperature, and the cold produced by the action of the Bergson tube was soon observed. Dr. Richardson, in searching for a means of applying cold, saw the applicability of this principle to his purposes, and devised the following arrangement, whereby ether and other volatile fluids may be rapidly vaporized and directed to any desirable point. It consists of a graduated bottle for holding the ether; in the mouth of this, and passing through a good cork, is a double glass tube, so arranged that the inner

and smaller tube shall reach the bottom of the bottle and upwards nearly to the mouth of the outer tube. The latter is pierced horizontally, just above the cork, by a smaller tube, by means of which it is attached to a hand bellows by a gum tube. The outer tube is also perforated by a small hole communicating with the interior of the bottle. When a current of air is forced horizontally into the larger tube it impinges against the opposite side, compressing the air in the bottle, and thus forcing the ether to rise in the small inner tube, whilst the main body of the air takes a vertical direction and escapes above with great force, carrying with it the ether, which is thus very rapidly, vaporized, producing extreme cold. By altering the size of the opening of the inner tube by movable jets, and by having two apertures for the entrance of air, and two pairs of bellows, the operator can continue the proportion of ether and air, and can readily produce a cold of six degrees below the zero of Fahrenheit. Dr. Richardson remarks, (Med. Times and Gaz., Feb. 3, 1866): "By this simple apparatus, at any temperature of the day and at any season, the surgeon has thus in his hands a means for producing cold even six degrees below zero; and by directing the spray upon a half-inch test-tube, containing water, he can produce a column of ice in two minutes at most. Further, by this modification of Siegle's (Bergson's) apparatus, he can distribute fluids in the form of spray into any of the cavities of the body—into the bladder, for instance, by means of a spray catheter, or into the uterus by an uterine spray catheter."

"When the ether spray thus produced is directed upon the outer skin, the skin is rendered insensible within a minute; but the effects do not end here. So soon as the skin is divided the ether begins to exert on the nervous filaments the double action of cold and of etherization; so that the narcotism can be extended deeply to any desired extent. Pure rectified ether used in this manner is entirely negative; it causes no irritation, and may be applied to a deep wound, as I shall show, without any danger. I have applied it to the mucous membrane of my own eye, after first chilling the ball with the lid closed."

Dr. Richardson's paper then details several surgical cases wherein his method had been successfully employed, (See Amer.

Jour. Med. Sci., April, 1866, page 513), and continues: "These results are so interesting that I make no apology for bringing them at once before my medical brethren. I wish it to be distinctly understood, that at the present moment I only introduce the method here described for the production of superficial local anæsthesia. It is, I believe, applicable to a large number of minor operations, for which the more dangerous agent, chloroform, is now commonly employed—I mean such operations as tooth extraction, tying nævus, tying piles, incising carbuncles, opening abscesses, putting in sutures, removing small tumors, removing the toe nail, dividing tendons, operating for fistula, removing cancer of the lip and other similar minor operations."

Dr. Richardson expresses the opinion that much more may be expected from this mode of producing anæsthesia, and thinks that even a limb might be amputated if some fluid of negative qualities and low boiling point can be obtained from the hydrocarbon series, (a suggestion which appears to have been realized, so far as the fluid is concerned, in the so-called rhigolene, of Dr. Bigelow, See page 363 of this number.) He also entertains the hope that a way will be discovered to join the agency of bodies like morphia, atropia, &c., with ether in this method so as to narcotize the parts. "Reaction from anæsthesia is in no degree painful, and hemorrhage is almost entirely controlled during the anæthesia."

Dr. Calvin H. Page, in the paper before quoted, speaks of an atomizer of his own invention, which differs from the instrument of Dr. Richardson, the tubes being horizontal and parallel for about three inches, but not concentric; and he esteems it well adapted to operating in the mouth. The points of the tubes approach each other at right angles, and the fluid-bearing tube bends at right angles and descends into the bottle of ether or other fluid used. With ether it produced a cold of —4° and with rhigolene —16° in one minute. Dr. Page believes the latter fluid to be better adapted for operations of the mouth than ether. He had used it with success in certain minor surgical operations. The greatest difficulty attending its use is the fact of its boiling below the ordinary temperature in summer, and its great inflammability. The reader is referred to an article on spray-producing

instruments, figured and described by the editor of the "Medical Record," N. Y., for June 1st, 1866.

It is not impossible that the atomizer, as a means of refrigeration, may be advantageously applied in some pharmaceutical and chemical operations on a small scale, where it it is desirable to have a low temperature for a short time; for instance, in making suppositories, where a difficulty occurs in separating them from the moulds, a few moments' action of a Bergson's tube with ether or rhigolene, would cause the necessary shrinkage; or in testing oils by reduced temperature.

AUBERGIER'S SYRUP OF LACTUCARIUM.

By William Procter, Jr.

Previous to the introduction of Syrup of Lactucarium into the Pharmacopœia, Aubergier's preparation was that chiefly used in Philadelphia, and perhaps elsewhere in the United States. The officinal syrup is so very different from Aubergier's, that it has continued in use since the publication of the Pharmacopœia, and apothecaries are not always satisfied which preparation is intended by prescribers. The literal translation of the formula for Aubergier's syrup is not adapted to ordinary usage, and it has been deemed useful to modify the manipulation so as to reach the same end.

Take of Lactucarium, (German), half an ounce,
Sugar, granulated, an ounce,
Simple syrup, four and a-half pints,
Citric acid, in powder, sixty grains,
Orange flower water, four fluidounces,
Alcohol,
Water, each a sufficient quantity.

Triturate the lactucarium with the sugar until it is reduced to powder, put it in a funnel prepared for percolation, pour on diluted alcohol until the lactucarium is nearly exhausted, or until ten fluidounces of percolate has passed, evaporate to two fluidounces, and add it to the syrup, previously heated to boiling, and mix; continue the ebullition slowly until the whole measures four pints and six fluidounces. Then add the citric acid and

strain, and lastly, when nearly cool, the orange-flower water, and mix them.

Each fluidounce contains the strength of three and a-third grains of lactucarium. Thus made the syrup is light brown in color and transparent. The clarification by albumen, recommended by Aubergier, is not always necessary, though sometimes it has been required. The use of sugar for dividing the lactucarium, and the subsequent concentration of the tincture in contact with sugar, aids in retaining those ingredients in solution, which usually separate as the syrup cools, and make it cloudy in the Pharmacopœia preparation.

ON FLAVORING EXTRACTS.

By the Editor.

A correspondent having requested us to re-publish our article on this subject, to be found at page 215, vol. 28th, of this Journal, (1856,) we take advantage of the occasion to modify and extend it somewhat, as well because that volume is now out of print, as because some improvements have occurred since that time.

EXTRACT OF LEMON.

Take of the Exterior rind of lemons, two ounces.
Alcohol 95°, (deodorized,) two pints.
Recent oil of lemons, three fluidounces.

Expose the rind to the air until partially dried, then bruise it in a wedgewood mortar, and add it to the alcohol, with agitation, until the color is extracted; then add the oil, and, if it does not immediately dissolve and become clear, let it stand, with occasional agitation, for a day or two and filter.

The color for this extract may be obtained from safflower, but, for many reasons, it is better to use the natural lemon color. The object of exposing the rind is to avoid weakening the alcohol, which should be as pure as possible. When the materials used are the best, and the extract is well corked in a full bottle, it improves by standing a few weeks before filtering.

EXTRACT OF ORANGE.

Take of the Exterior rind of fresh oranges, two ounces.
Alcohol, 95°, a pint.
Recent oil of orange, two fluidounces.

Proceed as in the recipe for Extract of Lemons.

It is much more difficult to obtain oil of orange in a fit state for making this extract than that of lemons; and none should be used that is not perfectly free from the terebinthinate odor developed by exposure and age. In purchasing the oil for this purpose, it should be put into small bottles nearly full, closely sealed and kept in a dark place.

EXTRACT OF BITTER ALMONDS.

Take of Oil of bitter almonds, two fluidrachms.
Alcohol (95°), a pint.
Tincture of turmeric or safflower, half a fluidrachm or q. s.

Mix them. The directions accompanying this preparation should state that it is poisonous in quality.

It is not unusual, in England, to deprive the oil of bitter almonds, to be used for flavoring, of its hydrocyanic acid, before diluting it. As some may prefer to do this, to secure their preparation from the danger always incident to selling so potent a poison as the oil of bitter almonds for culinary purposes, even as a solution, we offer the following process for removing the poison.

Take of Oil of bitter almonds, two ounces.
Sulphate of iron, (U. S. P.), an ounce.
Lime, recently burnt, half an ounce.
Water, a sufficient quantity.

Dissolve the iron salt in half a pint of water, slake the lime with a half a pint of the same fluid, and mix them. Shake this thoroughly with the oil in a bottle, then distil in a glass retort or small tin still, with a good refrigeratory, until the purified oil of bitter almonds has all distilled over, which is known by the distilled water ceasing to be milky and odorous. The heavy oil, after allowing time for its separation and subsidence, is removed for use.

EXTRACT OF ROSE.

Take of Oil of rose, half a fluidrachm.
Hundred-leaved roses, an ounce.
Deodorized alcohol, a pint.

Bruise the rose leaves, extract them by maceration in the alcohol, followed by expression, so as to get a pint, in which dissolve the oil, and filter. In the absence of the recent rose leaves, dried red rose leaves may be used, or this ingredient may be omitted, adding a minute quantity of tincture of cochineal, to give a pale rose tint.

EXTRACT OF CINNAMON.

Take of Oil of cinnamon, two fluidrachms.
Ceylon cinnamon in powder, half an ounce.
Deodorized alcohol and water, of each, a pint.

Dissolve the oil in the alcohol, and gradually add the water, and then the cinnamon, and agitate occasionally for several hours, lastly, filter the liquid through the dregs on a paper filter, so that it may be transparent. This preparation is much improved by using oil of Ceylon cinnamon, but, where the oil of cassia is employed, the cinnamon powder partially corrects its flavor.

EXTRACT OF NUTMEGS (OR MACE).

Take of Oil of nutmegs of good quality, two fluidrachms.
Mace, in coarse powder, an ounce.
Deodorized alcohol, two pints.

Mix the oil and powdered mace together, add them to the alcohol, and, after several hours' maceration, filter the liquid through the dregs on a paper filter.

The extracts of CLOVES and of ALLSPICE may be made by this formula, using the respective oils and powders, being careful to select materials in good condition.

EXTRACT OF GINGER.

Take of Jamaica ginger, in fine powder, four ounces.
Alcohol, deodorized, a sufficient quantity.
Simple syrup, half a pint.

Pack the ginger, moistened with a little alcohol, in a funnel

and percolator, and pour on alcohol until a pint and a half of tincture has passed; to this add the syrup and mix. If properly prepared, no precipitation occurs.

EXTRACT OF BLACK PEPPER—EXTRACT OF CAPSICUM.

These are made from powdered pepper and capsicum in the manner directed for ginger, except that the sugar be omitted, and a sufficiency of alcohol used to make the measure of two pints.

EXTRACT OF CELERY.

This extract, like the two preceding it, is employed as a condiment for meat sauces, rather than pastry. In France, the leaves and fruit, or seed, so called, are distilled to get a volatile oil called Huile d'ache, and the extract used there is probably an alcoholic solution of the oil of celery. The extract of celery used in this country is made from the seeds by percolating them with concentrated alcohol. The following recipe affords a good preparation:—

Take of Celery seeds, (Apium graveolens,) two ounces.
Deodorized alcohol, (95 per cent.)
Water, each a sufficient quantity.

Bruise the seeds finely, pack them in a small percolator, and gradually pour on a pint of alcohol; then add water, until first a pint of tincture and then a pint of infusion have passed; mix these, triturate with a drachm of carbonate of magnesia, and filter through paper. As thus made, extract of celery has a light brown color, an agreeable odor, and a well-marked taste of celery.

EXTRACT OF SOUP HERBS.

Take of Thyme, sweet marjoram, sweet basil, summer savory, each an ounce.
Celery seed, a drachm.

Bruise them together until reduced to powder, and percolate with sufficient diluted alcohol to make a pint of extract. The menstruum should be made with deodorized alcohol. Some prefer to add grated lemon peel, half an ounce, and either a little onion or garlic.

EXTRACT OF CORIANDER.

Take of Coriander, in powder, four ounces.
Oil of Coriander, a fluidrachm.
Alcohol, (95°,) a pint and a half.
Water, half a pint.

Mix the alcohol and water, then add the coriander, previously mixed with the oil, and macerate for twenty-four hours, with occasional agitation, finally decant the liquid from the dregs, put these in a percolator, and pour on the decanted liquid; when this disappears, add sufficient diluted alcohol to make the percolate measure two pints.

EXTRACT OF VANILLA.

Take of Vanilla of good quality, an ounce.
Coarse granular sugar, two ounces.
Simple syrup, a pint.
Diluted alcohol, a sufficient quantity.

Cut the vanilla transversely in small sections, and triturate it with the sugar until reduced to coarse powder, put this in a glass funnel prepared for percolation, and pour on diluted alcohol until a pint of tincture has passed; add this to the syrup, and mix them.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

Ozone as the cause of the decomposition of Iodide of Potassium Ointment.—M. Dannecy, of Bordeaux, referring to the frequency with which this ointment becomes discolored, and the irregularity of its occurrence when a series of experiments were made, has arrived at the conclusion that it is a phenomenon due to ozone in the atmosphere, and that it occurs most readily at those periods when the electric condition of the atmosphere favors the production of ozone. The author had occasion to prepare this ointment for the same person many times during several months, and found, in ten repetitions, three or four times it was perfectly white the next day, whilst in the other cases, the color varied from pale yellow to deep yellowish brown—he being convinced

that it was due neither to the grease, the iodide, the water nor to the manipulation. Since arriving at this conclusion he has had it confirmed to his own satisfaction.—*Repert. de Pharm.*, Mai., 1866.

New facts relating to fixed Oils. By M. J. Nicklés.—There exists in the commerce of southern France, an oil called *oil of apricots*, which resembles the *oil of sweet almonds* in appearance and many of its properties, but is cheaper, and is used for adulterating the latter oil. The author was called upon to assay a sample of oil of sweet almonds suspected of this adulteration. He found that oil of apricots was susceptible to the action of hydrated lime in powder, forming with it an emulsion, which slowly takes an unctious consistence; on the contrary, oil of almonds is not emulsionized in this case; by repose the calcareous powder separates little by little and leaves the oil clear.

But when a certain quantity of oil of apricots is present, it emulsionizes by agitation, and on standing, the unctious compound of oil of apricots and lime is deposited, and may be separated by filtration. This unctious matter, which is neither an oil nor a soap, is fusible in the water bath, and becomes a limpid liquid, which concretes on cooling; but less dense than water, it floats on boiling water unchanged, except in consistence. It is soluble in hot oil, but on cooling it separates as a white cloudiness, more or less dense, which can be removed by filtration. This unctious compound may be freed from any excess of lime by filtering hot, and is soluble in bisulphuret of carbon. The following is the author's process for applying the test.

Take 185 grains of the suspected oil of almonds, and agitate it with about 23 grains of hydrate of lime, then heat it at a temperature below 212° F., filter hot in a heated funnel. By cooling the filtrate by ice water, the oil loses its transparence if oil of apricots was present. The author finds olive oil and oil of colza behave like oil of almonds; whilst the oils of hemp seed, poppy seed, groundnuts, walnuts and flaxseed produce more or less of this unctious matter in the presence of hydrate of lime; cotton seed oil gives but very little; castor oil forms a thick coagulum almost like resin.

The author believes this process may be utilized in regard to

the three non-coagulable oils above stated.—*Journ. de Pharm.*, Mai., 1866.

New means of discovering Iodine in Liquids.—M. Laronde suggests the use of petroleum oil for this purpose; ten grammes of the liquid to be assayed is put in a test tube with one gramme of the oil and agitated; drop in a few drops of nitric acid, and then two drops of liquid chloride of lime and again agitate. The oil soon rises to the surface with all the iodine in solution, with a more or less rose water.—*Journ. de Pharmacie.*

Soluble Citrate of Magnesia Crystallized. By M. Morelli, of Lille.—I have recently noticed in the *Repertoire de Pharmacie*, a process for obtaining crystallized citrate of magnesia. It is about two years that I have been in the habit of preparing it for use in my shop by a different method. My method, because of its easy execution, it appears to me, will be of use to my confreres, which is the reason I make it known through your excellent Journal.

Take of Citric acid, in powder,	1400	parts.
Sub-carbonate of magnesia,	660	"
Water,	550	"

These substances, mixed intimately in an earthen vessel, form a liquid paste which swells up by the reaction between the acid and carbonate. It is necessary to stir the mass from time to time with a wooden spatula. After an hour or two the disengagement of carbonic acid ceases and the materials are slowly transformed into a crystalline mass analogous to moist sugar. It is finished by drying in the air. This salt being in microscopic crystals dissolves very rapidly in four times its weight of water; it is the bi-metallic citrate of M. Perret. The proportion of sub-carbonate is two-thirds of that necessary to saturate the acid. It is necessary to use an acid and carbonate of great purity.

Although this salt has a very acid taste, an agreeable solution can be obtained by the following recipe:

Take of Crystallized citrate of magnesia,	694	grains.
Bi-carbonate of soda,	77	"
Syrup,	770	"
Water sufficient for half a bottle.		

—*Repert. de Pharm.*, Mai, 1866.

Researches on the Volatile and fixed oil of the fruit of Samphire (*Crithmum maritimum.* By M. Hérouard.—The samphire is an umbelliferous plant growing abundantly on the rocky coasts of France and England. All parts of the plant are aromatic and it is used as an ingredient in flavoring pickles, etc. The most favorable time for the extraction of the volatile oil is from the 10th of September to the 15th of October, and the fruits yield 1·5 to 1·6 per cent of the oil.

The oil of samphire (*criste marine*) is composed of a light and a heavy oil, the latter separating from the milky distilled water on standing, the former, which is the aromatic oil of the plant, floating on top. This is limpid and mobile when recent, has a sweet odor and hot aromatic taste. It boils at about 350° Fahr. Its sp. gravity is 980° at 55° F. It is oxidized by the air, becomes thick and heavier than water; when recent, it remains fluid at 49° Fahr., but the old oils deposits silky needles when cooled. Further investigation found this body to be a result of oxidation, and to be an acid, and the oil itself to yield, by the action of weak nitric acid, a *hyduret* of a compound radical parallel with benzyl, which he calls *crithmyle*, and which forms combinations with chlorine, bromine and iodine. The acid by oxidation is *crithmic acid.*

Hyduret of Crithmyle is an oily brown liquid of sp. gr. 1·07, has an aromatic odor of the plant; its taste acrid and burning, affecting the throat strongly; it is insoluble in water but readily soluble in alcohol and ether, and burns with a sooty flame.

Crithmic Acid presents the form of colorless brilliant prismatic needles which resemble those of benzoic acid, a taste lightly acid, no odor, volatile without decomposition. Slightly soluble in cold water, more soluble in hot water, and readily in alcohol and ether and in the oil of samphire, from which it is derived.

The fixed oil of the fruit is siccative of an orange yellow color, and oxidizes readily in the air to a brown soft solid.—*Jour. de Pharm*, Mai, 1866, 324.

Orange leaf water as an adulteration of orange flower water. —M. Gobley, (*Jour. de Pharm.*, Avril, 1866, 249,) says that water distilled from orange leaves is sometimes substituted for or

mixed with orange flower water, than which it is much less odorant or agreeable. He proposes the following chemical means of distinguishing between these two waters. Twenty parts of nitric acid, 10 of sulphuric acid, and thirty of water are mixed. The assay is made by mixing one part of this test acid solution with five parts of the distilled water of orange flowers, when a rose color of greater or less depth, according to the strength of the water, occurs. With the water of the leaves no such coloration occurs. Unfortunately this test is only useful in distinguishing the separate waters, as it will not detect the presence of the leaf water even negatively, as flower orange flower water is made of several commercial strengths. It is also the opinion of M. Rabot, that age deprives this water of the property of being colored by the acid mixture. [We have tried this test with orange flower water, imported in flasks, and find it to react perfectly; but water made from oil of neroli did not react, so that this test will distinguish the distilled orange flower water from that made from oil of neroli.—Ed. Am. Jour. Pharm.]

Sericographis Mohitli and its coloring matter.—M. Thomas, Pharmacien attached to the French Expedition to Mexico, found in the valley of Orizaba, a plant called *Mohitli* by the Indians, much used by them in dysentery. They macerate the fresh leaves of this plant in water during several hours, which produces a beautiful violet blue-colored infusion, which is taken as a medicine the next day, fasting. The plant belongs to the natural order Acanthaceæ, and described by Nees Von Esanbeck under the name *Sericographis Mohitili.* The natives call it *yerba azul* (blue herb.) The aqueous extract of the plant has a deep blue color, is very hygroscopic and in great part re-dissolves in water. The solution again filtered and evaporated affords the coloring matter in a purer state, deep blue, amorphous and inodorous. Its solution acts with acids and alkalies like litmus. If the herb is acted on by water in a close vessel out of contact with air, the blue color is not developed, but the infusion, by simple agitation with air in a bottle partly filled, takes the blue tint. Protochloride of tin decolorizes the liquid and causes a deep green precipitate. The author calls the colorless natural principle *mohitleine*, the green color produced by the action of air on this

mohitleine, and that the blue color is due to the formation of *mohitlic acid* which, combined with alkaline bases of the salts contained in the water, yields the blue color. The latter statement needs corroboration.—*Jour. de Pharm.*, Avril, 1866.

Erythrocentaurin.—M. C. Méhu describes (Jour. de Pharmacie, Avril, 1866, p. 265,) this principle as existing in *Erythræa centaurium* as neutral, colorless, inodorous and tasteless. It fuses at 277° F., is not volatile, and crystallizes on cooling. At a higher temperature it is consumed without residue. It is soluble in 1630 parts of cold and 35 parts of boiling water, and in 48 parts of ordinary alcohol at 60° F., in 13 parts of chloroform and in 245 parts of strong ether. Fixed and volatile oils, benzine, and sulphuret of carbon, dissolves it readily, and much more hot than cold. It is remarkably indifferent to acids and alkalies. SO^3, dissolves it in quantity, without being colored, and the addition of water precipitates it in crystals. Neither nitric, muriatic nor chromic acids have any action upon it, nor have the mineral alkalies. Chlorine, bromine and iodine are without action on it at the ordinary temperature, but chlorine at its fusing point changes it. Oxide of silver, tannin, creasote, bisulphite of soda, acetate of lead, chlorides of platinum, mercury and iron do not. It, however, acts on permanganate of potassa in the cold. Its composition is, Carbon 67·66, Hydrogen 5·09, Oxygen 27·25 per cent, which corresponds with the formula $C_{27} H_{12} O_8$.

The most remarkable property of erythrocentaurin is that of being rapidly colored rose color by the solar rays, the coloration being rapid in proportion to the intensity of the light. This remarkable phenomenon is purely physical; it occurs whether the crystals be in air hydrogen, sulphuretted hydrogen, bicarburetted hydrogen, carbonic oxide or carbonic or sulphurous acids. After coloration it is not altered in weight, and on solution in any of its solvents becomes again colorless. It also becomes colorless at 270° F., and then is susceptible to the same action of light. The author has studied the influence of light on this substance very elaborately, and results of great interest have been developed. He finds only the most refrangible rays of the spectrum are active in modifying erythrocentaurin, and that analogous

effects may be produced by the agency of the light from colored glass, and by colored solutions of metallic salts in which the substances, are placed in sealed glass tubes. Though these blue and violet colored solutions act as the same colored glass in permitting the solar actinic rays to pass them, yet he finds many exceptions; for instance, a blue ammoniacal nitrate of copper allows these rays to pass, whilst equally blue ammoniacal nitrate of nickel does not permit any of them to pass. Sulphate of quinia and esculin completely arrest these rays, but we must refer our readers to the original paper above noted. The author has studied *santonin* in its relation to light and finds it in many respects like erythrocentaurin—but in others differs decidedly.

W. P., Jr.

NOTE ON BATTLEY'S SEDATIVE SOLUTION OF OPIUM.

By the Editor.

We have been repeatedly applied to for a formula for Battley's solution of opium, under the impression, by the querists, that an authentic copy of the recipe had been published. Physicians in Philadelphia, and probably other parts of the United States, prescribe it as though it were an officinal preparation. Yet it is parallel with McMunn's Elixir, and should be classed with secret preparations, if the latter be. Various recipes have been published for the preparation, some of them alleged to be genuine. The general impression among English writers of its composition is, that it is an aqueous solution of dry extract of opium, with about one-fourth of its bulk of alcohol added to render it permanent. Mr. Cooley, in his Cyclopædia of Practical Receipts, gives half a dozen versions of the recipe. The one which he appears to consider as nearly authentic is as follows:—

Liquor Opii Sedativus.

Take of hard aqueous extracts of opium, three ounces,
Rectified spirits, six fluidounces,
Water, a sufficient quantiy.

Boil the extract in thirty fluidounces of water till dissolved; when cold filter, add the alcohol and sufficient water to make forty fluidounces *Imperial measure.*

As crude opium yields from a-half to eleven-twentieths its weight of officinal extract to cold water, his recipe makes the preparation somewhat stronger than laudanum, whilst Prof. Redwood, in his "Supplement to the Pharmacopœia," remarks, "The strength of the liquor is about equal to that of laudanum, and is given in nearly equal doses."

Mr. Wilkinson (Pharm. Jour. vol. xii. page 253) assayed the genuine liquor opii sedativus, and arrived at the conclusion that it was intended to be of the strength of the laudanum of the London Pharmacopœia. Hence I believe we may fairly assume, from the evidence, that its strength corresponds with that of laudanum. Battley's sedative solution is imported at a price which places it beyond the reach of many for whom opium is prescribed, retailing at one dollar per fluidounce. This is a sufficient reason why the preparation, if it has merit, should be made here, and by a regular and recognized formula. Now, if physicians who desire to use this preparation would employ the "deodorized tincture of opium" of the Pharmacopœia, they will find all the merit which Battley's solution can have, in a greater degree, assuming it to be made by the formula above noted or an analogous one. It is pretty well understood that the substance or substances which render laudanum offensive to many persons, consist of the odorous rank matter and probably resinous matter. By using cold water much of these principles is avoided, especially if the watery solution is evaporated to dryness and the extract re-dissolved, which rejects more. For the same reason old dry opium pills, and roasted opium are less offensive to some patients than opium in its recent state. In Dr. Squibb's Liquor Opii Compositus the same method of getting rid of the odorous matter is resorted to, including the evaporation and ethereal treatment, with the addition of some Hoffman's Anodyne as a corrective. In view of all the evidence, we believe that deodorized tincture of opium fully represents Battley's solution in strength and in acceptability to the stomach; and that the apothecary is justified in preparing Battley's solution by the formula above given.

THE PREPARATION OF SULPHOCYANIDE OF POTASSIUM.

By James F. Babcock, Boston.

The usual process for the preparation of this salt, as given by Fresenius, is as follows:

"Mix together 46 parts anhydrous ferrocyanide of potassium, 17 parts of carbonate of potassa, and 32 parts of sulphur; introduce the mixture into an iron pan provided with a lid, and fuse over a gentle fire. Maintain the same temperature until the swelling of the mass which ensues at first has completely subsided, and given place to a state of tranquil and clear fusion; increase the temperature now towards the end of the operation, to faint redness, in order to decompose the hyposulphite of potassa which has been formed in the process. Remove the half-refrigerated and still soft mass from the pan, crush it, and boil repeatedly with alcohol of from 80 to 90 per cent.

"Upon cooling, part of the sulphocyanide of potassium will separate in colorless crystals; to obtain the remainder, distil the alcohol from the mother liquor."—*Fresenius' Qual. Analysis, 6th ed. p.* 57.

Those who have attempted this process may have been disappointed in not obtaining so large an amount of sulphocyanide as they were led to expect. The process is, when best conducted, far from economical.

The management of the heat is difficult, as well as the exclusion of the air; and the subsequent boiling "*repeatedly with alcohol of from* 80 *to* 90 *per cent.*" is of course expensive.

Moreover, the slimy mass left after the solution has been made retards, and in some cases almost totally prevents the filtration of the liquid, while it has been the writer's experience to find it extremely difficult by this process to get rid entirely of the sulphide of potassium formed, the presence of which unfits the sulphocyanide for the ordinary uses to which it is applied. Repeated failures by this and other methods in use, as the "bisulphide of carbon and ammonia process," (London *Pharm. Journ.*, Vol. VII. No. 4,) which is certainly disagreeable, and not entirely free from the objections mentioned above; and the want of a process really economical led to experiments, the re-

sult of which is the following method, which has been found uniformly to give good results, a large yield, and to require far less alcohol than any other process known to the writer.

The saving in alcohol, where the quantity prepared is large, is of course of considerable importance.

The process is as follows:

Take of cyanide of potassium, in small pieces of about the size of a pea, two parts by weight; sulphur one part.

Mix thoroughly, and fuse gently in an iron pan over a Bunsen's burner, until the cyanide is entirely fused and mixed with the melted sulphur, and the blue flame of sulphur, and the scintillation caused by the burning of minute particles of iron, have ceased; and allow the whole to cool, until a drop let fall into water no longer produces a hissing sound.

Then pour the still soft mass into three parts of water, in which it immediately dissolves; filter, to separate impurities, particles of sulphuret of iron, etc. The filtrate contains a large amount of sulphocyanide of potassium, mixed with sulphide, hyposulphite, cyanate, etc.; the next step is for the removal of these.

This is simply and perfectly attained by the addition, with constant stirring, of dilute sulphuric acid (1 to 4), until the reaction is slightly acid. This operation should be performed under a hood, or in some place where the gases evolved may be removed.

Sulphocyanide of potassium is neutral to test paper, and not affected by dilute sulphuric acid in the cold, while all the other substances mentioned above are at once decomposed, evolving sulphuretted hydrogen and cyanogen compounds, and depositing a considerable amount of sulphur.

The liquid is filtered to separate this, and then contains only sulphocyanide of potassium and sulphate of potassa; the quantity of the latter depends upon the purity of the cyanide of potassium employed, since any carbonate present forms direct sulphur compounds, which are afterwards decomposed by the sulphuric acid added. Where the amount of sulphate formed is large, it may partially separate with the sulphur, as a dirty, white, crystalline powder.

The filtered liquid is evaporated to one-third its bulk, and allowed to cool, to deposit a quantity of sulphate of potassa. It is then mixed with its own volume of alcohol of about 90 per cent., which causes the precipitation of almost the whole of the sulphate of potassa (*Anthon, J. Pr. Ch.*, Vol. 14, p. 25).

The solution after filtration may be evaporated to dryness, and yields a product containing only a trace of sulphate of potassa, and of sufficient purity without further crystallization, for any of the purposes for which it is required,—whether as a reagent, (*iron test,*) the precipitation of sulphocyanide of mercury for "Pharaoh's Serpents," or the preparation of the ammonium salt for photography. Subsequent crystallization from alcohol yields the salt perfectly pure.

The commercial cyanide of potassium, being very impure from carbonate and cyanate of potassa, is not so well adapted for use in this process as that known as "granular cyanide;" the increased price of the latter being more than compensated by the larger yield and improved quality of the product. Good commercial cyanide gives, however, very good results.

The heat required is not great, and the vessel should be removed from the fire as soon as possible after the formation of the sulphocyanide, as it rapidly decomposes at a temperature of fusion, in contact with the air. This process gives equally satisfactory results, whether small or large quantities are operated upon, and has been perfectly successful in the hands of the writer in the preparation of quantities varying from two ounces to twenty-five pounds. The amount of sulphocyanide obtained is, with good cyanide of potassium, about equal to the weight of the latter employed.

Boston, June 23, 1866.

SMALL-POX REMEDY.

Editor Am. Jour. Pharm. *Dear Sir:*

The 47th number of Braithwaite's Retrospect for July, 1863, gives so favorable an account of the virtues of the *Sarracenia purpurea*, or American Pitcher-plant, in the cure of the small-pox and measles, that I was induced to procure a quantity of it

from the Botanic Garden of Mr. Gates, at Mt. Lebanon, N. Y., of course *in a dried state*, and *consisting only of stem, leaves, and flowers, but no roots;* and this I distributed among my medical friends, requesting they would report to me the effects of the medicine, if any, that I might compare them with my own experience. But I never received but one answer, which agreed with my own judgment, that the medicine did no harm, but was not as highly beneficial as the printed description gave us reason to expect.

I took no further trouble about it. But the Memphis *Daily Avalanche* of 10th inst. prints a copy of a letter to the editor of the *Evening Mail*, of London, England, that is so important that I send you a copy of it for publication; and remain

Yours, most respectfully,

JOHN MILLINGTON, M. D.

"SIR,—Some time ago seeing a paper written by Assistant Surgeon Miles, of the Royal Artillery, on the efficacy of the North American plant *Sarracenia purpurea*, or pitcher plant, in the treatment of small-pox among the Indians, my colleague Mr. Agnis and myself have given this remedy, which has been imported into this country by Dr. Miles, a fair trial; and I am happy to say the eleven cases in our hands have recovered under its peculiar influence.

"This remedy I consider a boon to the public, for this reason: it is so easily managed, any person can make a decoction or infusion of the root, like tea. One ounce of the *root* is sliced and infused in a quart of water, and allowed to simmer down to a pint, and given in two table-spoonful doses every four hours, while the patient is well nourished with beef tea and arrow-root. Four of the cases in my hospital have been severely confluent, the pustules thickly running into each other. They have throughout the disease all been perfectly sensible and free from pain, and have not felt weak. I have carefully watched the effects of the medicine, which seemed to arrest the development of the pustules, killing, as it were, the virus from within, and thereby changing the character of the disease; and doing away with the cause of pitting without opening the pustules. In my opinion all anticipation of disfigurement may now be calmed,

provided the medicine is given from the commencement of the disease. Before leaving this subject, I may here caution the public that the efficacious part of the plant is the *root*. With the usual kindness of Dr. Gibson, the Director General, I have been amply supplied with it for the use of my regiment; and I hope to hear of it in every family medicine chest, and that it may be generally cultivated in every garden. And before long then we shall see no more faces—as described by Dickens—like the interior surface of sliced pumpkins.

"I am most respectfully yours,

COSMO G. LOGIE,

Surg. Maj. Royal Horse Guards, Windsor, Eng."

25*th May*, 1863.

ADVICE UPON EPIDEMIC CHOLERA.

BY EDWARD R. SQUIBB, M. D., Brooklyn, N. Y.

In view of a probable invasion of Epidemic Cholera, it is considered useful to try to attract early attention to the following circumstances, and to offer the advice which naturally results from their due consideration, to the end that the knowledge and experience gained in the medical profession through previous epidemics of the disease may be more generally known.

In previous epidemics many lives were lost, and much sickness occurred;—first, through want of early attention;—next, through the use of quack nostrums and specifics, which are generally hurtful, and are made and advertised to make money by; and lastly, through the want of simple information among the people as to the recognition of, and some uniform system of management for, the painless curable stages of the disease.

Cholera usually begins by a simple diarrhœa, which is too apt to escape notice, particularly in thoughtless persons and in children. If it can be seen by physicians in this early stage, a large proportion of the cases can be cured; and the earlier it is seen by physicians, the better it is for the patients, and the easier for the physicians.

In time of Cholera every movement of the bowels after the customary daily one, must be considered as a tendency towards

the disease; and a second unnatural movement establishes a diarrhœa, and should never be disregarded.

Parents, therefore, should watch their children closely at such times;—and all persons should pay strict attention to themselves, for this, the most curable stage of the whole disease, is often of short duration, and in it the disease is easily stopped in a large majority of cases.

The danger is in proportion to the frequency and copiousness of the discharges from the bowels; and vomiting and cramps, though often easily checked by the early attention of a physician, are always to be regarded as warnings of great danger.

The early diarrhœa is generally easily checked by very simple means. Often simply lying still in bed will check it. And all who have it should go to bed,—not so much because they are sick, as to insure them against getting sick. When quietly at rest in bed many very simple remedies will arrest a diarrhœa which would otherwise go on in spite of everything. When not in bed, the more quiet the better under all circumstances:—but to run about in the hot sun, or get excited, or irritated, or frightened, is very bad.

A diarrhœa, no matter how slight, cannot be considered cured until the discharges have entirely resumed their natural appearance and infrequency for two days, and even then it will recur from slighter causes than at first, and be more obstinate after each relapse.

No matter how mild or slight the diarrhœa may be, the physician should be informed of it if he be at hand, or can be easily reached. But if he be not at hand, time should not be lost in waiting for him; and with prompt and proper attention he may then not be needed at all. A simple mild diarrhœa is easily arrested by rest, diet, and a small dose of laudanum, with or without spirits of camphor taken after every discharge from the bowels; and such doses can always be had in a very few minutes from every apothecary's shop. But the experience of many epidemics has shown that a judicious combination of three or four medicines, all of which have been long used in various proportions, and about which there is no secrecy or complication,—is better adapted to the generality of such cases than any one or two of them; while such a combination is adapted to later stages and

more severe cases of the disease, to which laudanum and camphor alone would not so well apply.

Such a judicious combination, compiled from the recorded knowledge on the subject, it is believed will be found in the following mixture, which all good apothecaries can make and keep ready for use. And the public generally is strongly advised to adopt and rely upon this as being better and more safe than the advertised specifics and nostrums of the day; and as being all that the present state of knowledge will afford, and all that common sense and reason can expect from any remedy not adjusted to each special case, as remedies always should be if possible.

Apothecaries are also strongly advised to adopt this formula, name, and label,—to prepare the mixture carefully from good materials, and to sell it with the label and directions here given;—and to sell no other preparations, for these uses except upon the written prescription of a physician. The label and directions here given in full detail, are adapted to a four-ounce vial, and the apothecary only has to have them copied by his own label-printer, with his business card appended at the bottom.

Compound Tincture of Opium or Diarrhœa Mixture.

This Mixture is composed of Tincture of Opium, Spirit of Camphor, and Tincture of Capsicum, each one fluid ounce, Purified Chloroform, three fluidrachms, and a sufficient quantity of Stronger Alcohol to make the whole measure five fluidounces.

Each fluidrachm, or teaspoonful, contains about 100 drops, consisting of 12 minims of each of the first three ingredients and 4½ minims, or 18 drops of Chloroform.

DOSE: For persons over 18 years of age, a teaspoonful.

"	"	14 to 18	"	"	a small teaspoonful.
"	"	10 to 14	"	"	half a teaspoonful.
"	"	6 to 10	"	"	thirty drops.
"	"	2 to 6	"	"	ten to thirty drops.

For infants one to ten drops, according to age.

In time of Epidemic Cholera or Diarrhœa, when any person has two movements of the bowels more than natural within the 24 hours, the second one should be followed by a dose of this Mixture, the dose to be repeated after every movement that follows. If the movements increase in frequency or in copiousness after the second dose of the medicine has been taken, a physician should be sent for at once, and a double dose be taken after each movement until he arrives. Immediately after taking the first dose, the person should go to bed, and remain there for 12 hours after the diarrhœa has entirely ceased.

Appended to this paper, but by no means secondary to it in importance, is the excellent address to the public, published by the Metropolitan Board of Health, of New York. It is reprinted here, to increase, if possible, its dissemination.

METROPOLITAN BOARD OF HEALTH—ADDRESS TO THE PUBLIC.

The Board of Health publish this simple statement, and beg the public to give to it their earnest attention.

Cholera is generally a preventable disease, and in its early stages can be arrested if the habits be good. Study therefore temperance in eating and drinking. Do not believe that alcoholic stimulants are useful in guarding you against an attack. Let the food be nutritious, and keep the digestive organs in a healthful condition. Use no stale or uncooked vegetables. Let your meat be fresh and your vegetables be well cooked, and all fruits be fresh and ripe.

Cleanliness of the body is of the first consideration. Keep the skin in a healthy state by bathing the whole body, with a free use of soap. Cold bathing is best used in the morning—never just before going to bed. Dry frictions or the warm bath may be more safely used just before going to bed.

Cleanliness in your homes is of equal importance. Let your apartments be dry—never damp. Suffer no decayed vegetables or stagnant water to remain in your cellars or yards. Any disagreeable smell from privies, cesspools or sinks, is a proof of their unhealthfulness. Remove them by necessary repairs, lime, chloride of lime, or whitewashing. Ventilate well your houses and apartments. Expose your bedding to the air and sun. Avoid excessive fatigue. Keep regular hours in eating and sleeping. Wear flannel next to the skin. A good plan is, if the bowels are at all disordered, to wear a broad band of flannel (a flannel belly-band) around the body, reaching from the hips to the ribs. Maintain the natural temperature of the body by sufficient clothing; especially keep the feet warm. Never when heated sit on the grass or stone seats, or sleep under an open window. If exposed to wet, change your boots and clothes as soon as possible.

Take no purgative medicines, except by direction of a physician.

Cholera is almost invariably preceded by a painless diarrhœa, and this is in all cases to be promptly treated.

When diarrhœa is present, go to bed and maintain a position on the back, use abundance of blankets, and send for a physician.

A physician can always be obtained by applying at the nearest police station.

Stay in bed until you are well. Do not consider yourself well until you have had a natural movement from the bowels. Abstain from all drinks. Apply mustard plasters to the bowels.

In the absence of a physician the adult can take ten drops of laudanum and ten drops of spirits of camphor. A child of ten years may take five drops of laudanum and five of camphor. A child of five years may take three drops of laudanum and three of spirits of camphor; and these drops may be repeated every twenty minutes so long as diarrhœa or pain or vomiting continues. This will save time, *but in all cases send for a physician.*

Do not get up to pass the evacuations, but use the bed-pan or other conveniences.

Never chill the surface of the body by getting out of bed.

Remove immediately all the evacuations from your rooms; scald all the utensils used, or disinfect them with chloride of lime; scald also your soiled clothing.

NITRO-GLYCERINE.

By Enno Sander, Ph. D., St. Louis.

The nitro-glycerine, which has lately attracted the public attention by such terrific explosions, is formed when glycerine is gradually added at low temperature to a cooled mixture of nitric and sulphuric acids. It is supposed that the nitric acid $3NO_5$ splits into $3NO_4$ and O_3, which latter combine with 3H from the glycerine $= C_6 H_8 O_6$ to 3HO, while the $3NO_4$ take the place of 3H in the glycerine and produce the compound nitro-glycerine $= C_6 H_5 3(N O_4)O_6$. The pure nitro-glycerine is a heavy, oily liquid of nearly 1·60 specific gravity; clear, slightly straw colored; explodes by concussion, not by being ignited; ceases

to burn when the light is removed, and decomposes with explosion at a temperature of 350° F. Under the name of glonoin, it had been used in medicine; the inhalation of its fumes cured violent headache, and its action on the animal system is, according to Dr. Demme, of Bern, similar to strychnia; its employment would be indicated in those cases where nux vomica is used, the effects of which it seemed to excel in some instances.

It may be from the fact that never large quantities at a time have been prepared and preserved, or that the chemists have operated with pure materials only, no accident from explosion or otherwise has been recorded;* to the contrary, it has not been considered dangerous except when taken internally.

I am unable to state whether nitro-glycerine has been applied technically, otherwise than as Nobel's Blasting Oil (Spreng-Oel) which Mr. Nobel claims to be almost pure, at least as much so as an article of that kind permits to be without becoming too expensive. This patent blasting oil is an oily liquid of a light gray color of the same specific gravity as the other, and also insoluble in water. It claims in fact the same properties as the pure glonoin and the same relations to test. Mr. Nobel, in reply to a statement of spontaneous decomposition of nitro-glycerine, denies it positively that his compound, even if spontaneously decomposed, could ignite and explode, for it *only explodes at a temperature of* 350° *F.*, and it is very doubtful that any liquid should acquire such a temperature by slow organic decomposition. He also states that a bottle of oil, for twelve years in his possession, has been treated in boiling water many a time, exposed to the action of the sun and various chemical substances without showing the slightest trace of decomposition. He attributes the decomposition of the oil alluded to solely to impurities contained in it.

A communication to a scientific society at Berlin, in speaking of the blasting oil, considers its "harmlessness" on being transported or stored—a great advantage over gunpowder, which it also exceeds more than twenty times in explosive power. The

[* This is an error, (see Amer. Jour. Pharm., 1860, page 524,) as Dr. Chas. Ferris nearly lost his sight by the explosion of this substance by heat.—Ed. Am. J. Pharm.]

regular explosion in blasting is caused by a patent fuse and patent cap.

I have tried to give you a condensed report of all the information concerning this compound which I could obtain from the periodicals I have access to. It is entirely insufficient as regards the explanation of the three terrible explosions at New York, Aspinwall and San Francisco, for even thus far we cannot find anything which would permit us even to guess at the causes of the spontaneous combustion. We must expect, however, that chemists will now feel an interest in the matter, and study this compound in regard to its decompositions, and find out the means of avoiding the repetition of such unfortunate catastrophes.—*Medical Reporter*, St. Louis, May 15, 1866.

EXPLOSION OF NITRO-GLYCERINE.

The terribly explosive properties of this dangerous substance have been illustrated by a painful coincidence of events in San Francisco and Aspinwall, by which many lives and much property have been destroyed. It is strange that similar accidents have not previously occurred in the mining districts of the Pacific coast. Nitro-glycerine, or glonoine, as it is sometimes called in medicine, is prepared by allowing glycerine to fall drop by drop into a mixture of equal parts of nitric acid and oil of vitrol, care being taken to prevent the temperature from rising too high. A heavy, oily-looking liquid collects at the bottom of the vessel, which has a sweetish aromatic taste, and is a dangerous poison. A single drop placed upon the tongue produces a severe pain in the head for hours. Its formula is $C_6\,H_6\,2(NO_4)O_6$, or for two equivalents of hydrogen in the glycerine two of peroxide of nitrogen are substituted. A drop placed upon paper and struck on an anvil produces a powerful concussion. Under circumstances little understood the friction of its particles among themselves even when frozen, or contact with some foreign substance, is sufficient to produce such effects as those below given. Its manufacture or storage in some parts of Europe is forbidden, and the Mayor of New York has acted wisely in causing the removal of all found in that city.

The following facts are from the *Panama Star and Herald:*

"Nearly, if not all the local freight of the European had been delivered, when about 7 o'clock in the morning of the 3d, a terrific explosion occurred on board, which tore away the upper parts of the ship and blew several large plates off the side. The wharf at which the ship was unloading, and which was some four hundred feet long, was literally torn to pieces; the superstructure was completely demolished to within a hundred feet of the freight house, and hardly a plank remained in the entire length of the structure that was not wrenched from its fastenings.

"Immediately in front of where the vessel lay a gap was cut through the wharf, piles, planking, etc., all disappearing. The ship and wharf both caught fire, and the latter was saved from entire destruction only by the exertions of several citizens, who got the fire engine to work, and after a few hours extinguished the flames, regardless of the risk they incurred from another explosion of the burning ship. The Panama Railroad Company's splendid freight house is left a pile of ruins. The force of air caused by the concussion seems to have raised the roof—which was constructed of iron and slate—upwards a few feet, its own weight bringing it down with immense force into the building, and carrying with it both the end walls, leaving the house, excepting the side walls, which appear but little if at all injured, a mass of ruins. * * * * *

"The most awful part of the catastrophe was the dreadful loss of life and suffering attending it. Of the number killed and missing it is impossible to give a correct estimate; but from present data the number may be safely put down at fifty, and is, we fear, more likely to prove over this number than under it. Of the forty-one men comprising the crew of the European, nine have been killed and twelve are missing.

"The scene in Aspinwall after the first explosion cannot be described—it was harrowing in the extreme. Whilst the ruins gave an air of desolation to the place, the mangled and lacerated bodies or pieces of bodies, to be met with in every direction for a great distance around the ruin of the disaster, were heart-rending, and the suffering of the poor mortals crushed and bruised, in whom life was not extinct, was really dreadful.

"The amount of damage caused by the explosion is roughly

estimated at $1,000,000, which is about the lowest figure at which it can be placed."—*Boston Med. and Surg. Journal.*

Another Explosion at San Francisco.—As we go to press, news arrives of another fearful explosion, supposed to be of nitro-glycerine, on April 16. The number of persons killed and the amount of damage done appears to have been greater than in any previous casuality of the kind. We may here state that a bill to regulate the storage and transport of nitro-glycerine will be introduced into the House of Commons immediately. It is intended to put nitro-glycerine under the same restrictions as fulminating mercury and similar compounds.—*Chem. News, June* 1, 1866.

Rendering Nitro-Glycerine Non-Explosive.—It appears that practically there is no greater difficulty in rendering nitro-glycerine non-explosive and explosive at pleasure than there is in accomplishing the same feat with gunpowder, although the means employed are, of course, dissimilar. The recent accidents with the new explosive agents have induced Mr. Nobel to turn his attention seriously to the subject, and he is now enabled to state that by mixing the nitro-glycerine with methylic alcohol (a cheap spirit, popularly known as spirit of wood) the nitro-glycerine is rendered unexplosive, either by percussion or heat. When required for use water is added, which absorbs the spirit, and the oil sinks to the bottom of the vessel, whence it is drawn by a syphon, and its explosive nature thereupon found to be restored. Experiments for testing the value of this discovery have already been made in America, and given highly satisfactory results. We look upon the subject as one of the greatest importance to miners, and shall be glad if the new discovery enables us to transport nitro-glycerine, at least as safely as blasting-powder, while we believe it has already been proved much more efficacious.—*Chem. News, June* 8, 1866, from *Mining Journal.*

NOTE ON THE TENACITY OF LIFE OF THE SEEDS AND SPORES OF SOME PLANTS.

By Prof. William H. Brewer.

Edwards and Colin (Annales des Sci. Nat., [2], Bot. I, 257) made experiments on the power of resisting elevated or de-

pressed temperature possessed by the seeds of various leguminous and cereal plants. They found that all lost their vitality if heated in water at 167° F., which is the temperature at which starch grains burst. The most of the seeds had their vitality destroyed when heated in water below this, but would stand a temperature of 122°; while in steam they would stand 144° F.; and in *dry* air some germinated after being heated a very short time to 167° F. Above this all lost their vitality. Some would stand a dry cold of 70° F. below zero.

Berkley states (Introduct. to Cryptogam. Bot. p. 68) that he has "recorded an instance of the germination of thousands of grape seeds after three emersions in boiling water; and Dr. Lindley mentions the fact of raspberry seeds growing after being boiled for jam, in which case, if the sugar were really boiling, the temperature would be above the boiling point of water." The author considers, however, that the observations were not sufficiently exact in either case.

Balfour states (Class Book of Botany, p. 628) "the seeds of *Phytolacca decandra* and of the Raspberry have been known to germinate after exposure for a short time to the heat of boiling syrup," but does not give his authority.

Hemmingway states (Ann. of Nat. Hist., [1], viii, 317) that the seeds of *Sambucus nigra* germinated after being twice boiled in making wine, being present during the vinous fermentation, and remaining twenty months in the dregs of the cask.

In regard to the spores of Fungi, Berkley remarks (Outlines of British Fungology, 32) "that the spores of certain Fungi would bear a moist heat equal to that of boiling water without losing their power of germination. They have also considerable powers of resisting frost, but the exact limits in either case under varying circumstances have not at present been ascertained."

More to the point are the experiments of the eminent cryptogamic botanist, Payen, on the red mould in the interior of bread, which created such a stir in Paris nearly twenty years ago. This mould, the *Oïdium aurantiacum*, was developed in the interior of the bread within an incredibly short space of time after it had been baked, especially in the Barrack-bread, ("pain de munition,") at Paris. He found (Ann. de Chem. et

de Phys., [3], xxiv, 253) that pieces of bread, and also of dough, upon which the spores of this fungus had been sown, and then exposed in tubes in moist air for half an hour to the respective temperatures of 212°, 221°, and 248° F., afterwards produced the red fungus; while similar pieces of bread and dough, treated in a similar manner but not sown with the spores, did not yield this specific fungus. When the spores were heated in tubes to 284° F. they lost their red color, and then ceased to germinate.

It seems that in this case, as in that of the cereals, the vitality of the seeds or spores is retained under certain circumstances up to nearly or quite the temperature required to decompose the chemical substances in the seed, or to disorganize the structure. In the still lower Cryptogams we have no data either as to the chemical character of their spores, the temperatures required to change their organic compounds, or to disorganize their structure, and none whatever as to the temperatures they may withstand and still germinate. It seems, therefore, unsafe to assume, without proof to the contrary, that their vitality (germinating power) is destroyed at a temperature much below that required for their actual destruction or disorganization.

One of the most remarkable examples of tenacity of life in the higher plants is presented by the *Lewisia rediviva* of Western North America, a large-flowering fleshy plant, of the Portulaceæ, growing in British Columbia, Oregon and California. Dried specimens that have been two years or more in an herbarium will still grow, and are often troublesome from sprouting while between the papers. One specimen, collected by Dr. Lyall, of the British Navy, was "immersed in boiling water" to stop this growing propensity before drying out; and yet, more than a year and a half afterward, it showed symptoms of vitality, and in May of 1863 it produced its beautiful flowers in the Royal Gardens of Kew. This plant in flower is figured in Curtis's Botanical Magazine for August of that year. It is very desirable that some special experiments should be made to ascertain just how much boiling it may undergo without loss of vitality.

April 6th, 1866.

—*Silliman's Journ., May*, 1866.

OIL OF ANISEED AS A DEODORIZER OF TERSULPHIDE OF POTASSIUM.

By W. S. W. Ruschenberger, U. S. Navy.

A wish to use a solution of sulphuret of potassa as a lotion to a lady's skin led me to seek means to overcome or neutralize the odor of the preparation. Among other substances, I tested to a limited extent the deodorizing properties of the permanganate of potassa. For the purpose, I prepared a solution of the salt, from the manufactory of Mr. Morson, London, in the proportion of two parts to one thousand of distilled water by weight.

This solution was added to peppermint-water, to camphor-water, to a ten-grain solution of tersulphide of potassium, and to spirits of turpentine, in the proportion of about one part to two. There was no perceptible change of odor in either case, even after exposure to the air during twenty-four hours. The beautiful magenta color of the permanganate solution was wholly discharged in the mint-water, with a flocculent, light brown precipitate; in the turpentine, with a dark brown precipitate; and in the sulphuret solution, without precipitate. In the camphor-water the color remained unchanged, but there was a very slight brown precipitate after standing twenty-four hours.

To the mint-water, camphor-water and solution of tersulphide of potassium the solution of permanganate was added in excess. After exposure to the air during twenty-four hours, the characteristic odor of each article still adhered to it.

Recollecting that when I was engaged in anatomical studies, many years ago, I removed the cadaveric odor from my hands by washing them with camphorated tincture of opium, more expeditiously than by any other material then known to me: I added to a solution of tersulphide of potassium (sulphuret of potassa,) ten grains to a fluidounce of distilled water, twenty drops of opii tinctura camphorata. A very feeble but totally different odor remained; its offensiveness had disappeared, and the lotion was used without provoking any remark about its smell.

Which one of the constituents of the paregoric is the deodoriz-

ing agent? A solution of benzoic acid added to a solution of the tersulphide caused a white precipitate; the tersulphide was decomposed, and the offensive odor was intensified.

About a fluidrachm of anise water (prepared after the manner of preparing camphor-water) was added to an ounce of the ten-grain solution of the tersulphide of potassium, and the odor instantly changed its character, and was no longer offensive. A like effect followed the addition of a single drop of the oil of anise to two ounces of the same solution. No perceptible chemical change occurred in the solution.

A single drop of oil of anise was rubbed with a drachm of lard, and then five grains of tersulphide of potassium in fine powder were thoroughly mixed with it, to form an ointment which was without offensive odor.

The oil of anise employed in these experiments was more than two years old.

Is the phenomenon just mentioned due in any manner to the quality possessed by the vapor of the oil of aniseed to intercept radiant heat? Professor Tyndall, in his recent work, "Heat considered as a Mode of Motion," (New York edition, p. 374,) states that, regarding dry air at the tension of one atmosphere as unity, the absorbent power of the vapor of the oil of aniseed in intercepting radiant heat is represented at 372, which is greater than that of any other essential oil mentioned by him in this connection.

Whether this is to be regarded as an instance of catalysis, and the presence of the oil simply arrests the evolution of hyposulphuric acid, is a question to be determined. Chemists may or may not regard these suggestions worthy of consideration. I cannot attempt to account for the phenomenon.

Navy Yard, Boston, Mass., April 2, 1864.

—*Amer. Jour. Med. Sci.*. Oct., 1864.

POISONING BY EATING THE FRUIT OF THE RHUS TOXICODENDRON.

By J. W. Moorman, of Hardinsburg, Ky.

The poisonous effects of the Rhus Toxicodendron are well known. (See *Griffiths Medical Botany*, p. 184; *U. S. Dispensa-*

tory, 12th ed., p. 836, &c.) Nevertheless, but few cases, we believe, have been recorded of poisoning resulting from eating the fruit of the plant, and it therefore may be well to record two cases of this kind communicated to me by a professional friend.

The subjects of these cases were children, one six and the other eight years of age. The quantity eaten was nearly a pint. In a few hours the children became drowsy and stupid, and in a short time vomiting commenced, first of the partially digested fruit, afterwards of a thick, tenacious fluid of a wine color. Then convulsions of different parts of the body followed, accompanied by slight delirium. Respiration was hurried, pulse at first full and strong, but slow, afterwards, small, frequent and compressible; pupils dilated. Warm water was given to promote emesis, and thus clear the stomach of the poisonous matter; afterwards large quantities of carbonate of soda in solution, under the belief that it was an antidote to the poison. Otherwise they were treated on general principles. Both cases recovered, though the youngest convalesced very slowly.—*Am. Jour. Med. Sci., April*, 1866.

REMEDY FOR EPILEPSY.

By George C. Close.

A few months since, a copy of a recipe—said to be a remedy for epilepsy, and which had been put up by a New York firm, somewhat celebrated for their specialities—was handed to me, with a request to state my price for compounding it. I did so, and returned it to the person who handed it to me. Soon after, I received from two independent sources copies of what I know to be essentially, and believe to be precisely, the same recipe, with the intimation that it was of French origin.

The reason I now call the attention of the Association to this matter is, that I am informed that the firm mentioned above, and whom, for the sake of a name, I will call Jones, Smith & Co., are now advertising this article as their remedy for epilepsy.

I therefore wish to make the recipe public, so that when Jones, Smith & Co.'s remedy for epilepsy is inquired for, members may

tell their customers, if they choose, that the recipe has been published, and is not the property of the pretended owners. This I think will have a tendency, as it were, to "cut the corners" of quackery, which I believe is a legitimate object of this Association.

I have put up this recipe a large number of times, and am informed by one of my customers that it has proved an effectual remedy in his case.

It is as follows:—

℞.

Potassii bromidi, ...	ʒvi.
Ammonii bromidi, ...	℈ii.
Potassæ bicarb., ...	gr. xv.
Aquæ, ...	ʒiii.
Tinct. Columbæ, ...	ʒiss.

ℿ.

Dose, a teaspoonful three times a day.

—*Proc. Amer. Pharm. Assoc.*, 1865.

ON THE PHARMACOPŒIA STRENGTH OF BRANDY AND WHISKEY.

By Dr. W. H. Pile.

In examining recently some California brandy, of Perkins, Sterns & Co., said to be a very pure article, I found its alcoholic strength to be but 44 per cent. by volume by a standard Tralles' instrument. This would be equivalent to twelve degrees below proof. Our national Pharmacopœia gives the strength both of brandy and whiskey as ranging between 48 and 56 per cent. of absolute alcohol.

At first sight the above-mentioned brandy would appear to be but 4 per cent. below the inferior limit of strength. The question here arises, does the Pharmacopœia mean in its definition a percentage reckoned by volume or by weight? This is an important point to be established. As the Pharmacopœia is presumed to be complete in itself, the preliminary remarks were looked over to settle this query. Unfortunately, nothing is there found relating to this subject, and we are left to our own interpretation.

In the New Dispensatory, by Wood and Bache, 11th ed., under the head of Brandy we read that "it contains on an average 53 per cent., by measure, of alcohol of the density ·825." Now, as alcohol of this specific gravity contains but 92½ per cent. of pure alcohol, it follows that this brandy, containing but 53 per cent. of 92½ per cent., or 49 per cent., nearly, by volume, is within the limits of the definition given as brandy in the Pharmacopœia, provided percentage by volume is meant.

On the other hand, upon looking at the remarks under the head of whiskey, we find this paragraph: "It should contain from 48 to 56 per cent. alcohol, and its specific gravity, *therefore*, should not exceed ·922 at 60° F., nor be less than ·904." Now, an alcoholic liquor of these specific gravities will be found, by referring to the table of Tralles, to have a per cent. by volume of from 55½ to 64. This is much greater than the strength of brandy as found above. How is this discrepancy to be avoided? Who shall decide when doctors disagree?

It is unfortunate that the term percentage of alcohol was not determined to mean per cent. by volume, that measure being universally adopted in all commercial transactions, and also by the Revenue Department of our own and other countries. At any rate, the omission to state definitely what the Pharmacopœia intends by the term percentage of alcohol, must render the definitions of brandy and whiskey uncertain in regard to their strength.—*Proc. Amer. Pharm. Assoc.*, 1865.

ON THE USE OF GLYCERIN TO PREVENT THE DEPOSITION OF APOTHEME.

By A. B. Taylor.

"In what preparations may Glycerin be used to prevent the deposition of apotheme? What is the minimum quantity that will answer the purpose, and will such preparations bear dilution?"

The following remarks are offered in reply to the above query, which was accepted by me at the last meeting of the Association.

The only preparations, perhaps, in which Glycerin could be used for the purpose specified, are Fluid Extracts, Decoctions, Infusions and Tinctures, and accordingly experiments were instituted with specimens of each of these classes.

Fluid Extract of Cinchona.—This extract, prepared according to the formula given in my essay on the subject last year, appears to be in every respect satisfactory. I would not recommend any reduction in the quantity of Glycerin there ordered, although a trifling reduction might, perhaps, be made without injury to the preparation. Upon being diluted with water it is rendered turbid, but the infusion thus made extemporaneously becomes clear again, upon the addition of a small quantity of diluted sulphuric acid, or of elixir vitriol.

Fluid Extract of Catechu.

Fluid Extract of Kino.

Fluid Extract of Krameria.

The formulas given for these preparations, by Prof. Procter, in his paper on Fluid Extracts, published in the volume of Proceedings for 1863, are satisfactory, and the quantity of Glycerin as small as would be advisable.

The first two are miscible with water in any proportion without precipitation; the Fluid Extract of Krameria is slightly precipitated on the addition of water.

Fluid Extract of Rhubarb.—Not being entirely satisfied with this preparation, when made according to the U. S. Pharmacopœia, I was induced to prepare some after the following formula, in accordance with a suggestion offered in my essay, read last year.

Take of Rhubarb in moderately fine powder 16 troy-ounces.
Glycerin 8 fluidounces.
Alcohol 24 fluidounces.
Diluted alcohol a sufficient quantity.

Moisten the Rhubarb with four fluidounces of the alcohol, introduce it into a conical glass percolator, press it gently, and pour upon it gradually twelve fluidounces of alcohol. When the liquid has disappeared from the surface, gradually pour on, first a mixture of eight fluidounces each of Glycerin and Alcohol, and afterwards diluted Alcohol, until three pints of liquid have been obtained. Set aside the first pint obtained, in a warm place, until reduced by spontaneous evaporation to six fluidounces. Evaporate the remainder of the liquid by a gentle heat to ten

fluidounces, mix with the reserved portion, and strain, if necessary, through a muslin strainer.

The resulting extract, of which a specimen is herewith submitted, is of a deep reddish-brown color, entirely clear and transparent, in thin layers, and having in perfection the flavor of the root.

It is much thinner than the officinal extract, and, as is believed, will be found to be a more satisfactory preparation. A precipitate is formed by the addition of water; the extract is, however, soluble in all proportions in syrup, so that an elegant syrup may be prepared from it extemporaneously by the simple addition of syrup, and the syrup thus made of the officinal strength is miscible with water without precipitation. A sample is herewith presented.

Decoction of Yellow Cinchona.—For the purpose of comparison, two decoctions were prepared, one according to the U. S. Pharmacopœia, the other in the same manner, excepting the addition of a fluidounce of Glycerin in making a pint. The two decoctions were very similar in appearance; that containing the Glycerin having a rather darker color. No difference in the strength of the two could be discovered by the taste, the bitterness of one being somewhat disguised by the Glycerin. After standing for two days, both of the decoctions remained equally turbid; an ounce of the one containing Glycerin remained slightly turbid after the addition of two fluidrachms of Glycerin, but become perfectly clear upon the addition of a third fluidrachm.

The conclusion arrived at from these experiments was, that the addition of Glycerin to the decoction would not be advisable, for although a greater amount of extractive matter might be obtained from a given amount of the bark, still the same end (that is, increased strength) might be arrived at more simply and economically by using a larger quantity of the cinchona bark.

Infusion of Yellow Cinchona.—Two cold infusions, of half a pint each, were prepared, one with water, the other with water to which half an ounce of Glycerin had been added. (The aromatic sulphuric acid being left out in both cases.) The results and conclusions arrived at were substantially the same as in the preceding experiment with the decoctions.

Tincture of Cinchona.

Compound Tincture of Cinchona.

These tinctures were prepared according to the U. S. Pharmacopœia, with the exception that a fluidounce of Glycerin was substituted for a fluidounce of water in each pint of the menstruum used.

The resulting preparations did not differ in appearance or sensible properties from the officinal tinctures, and up to this time, now some three months, have not shown any disposition to precipitate cinchonic red, remaining perfectly clear and bright. This experiment is not decisive, but I am inclined to believe that the addition of this quantity of Glycerin to these tinctures is beneficial.—*Proc. Amer. Pharm. Assoc.*, 1865.

LOUISIANA ROCK SALT.

The New Orleans *Times* of a recent date has the following interesting account of the wonderful deposits of salt on Petite Anse Island:—

Perhaps the purest and most important natural deposit of salt in the world is that found on our coast, at Petite Anse Island. This deposit was referred to in French's "Historical Recollections of Louisiana." He quotes from the papers left by an English voyager who visited the Mississippi, or, as it was then spelt, *Mechacebe*, in 1698—99.

Strange as it may appear, all knowledge of this salt mine was lost among our people till after the commencement of the recent war. At that time the residents of the interior, who were unable to procure a supply of salt otherwise, resorted thither for the purpose of boiling down the briny waters which gurgled from the base of the island elevation. This, after some investigations and experiments in well-boring, resulted in the discovery of the fact that a great portion of the island, with the exception of an upper layer of earth, was a complete crystal mass of salt. The island was the property of Hon. D. D. Avery, and its value in the then condition of the Southern States was regarded as incalculable. For two years, nearly the whole of the trans-Mississippi was supplied from this mine, no

less than 21,000,000 pounds being taken from it in the course of three months.

When the islands passed into the hands of the Federal forces, the works, bridges and buildings were destroyed, but the solid rock of crystal wealth remained, and, is in future to form a prominent part of the material resources of Louisiana. The mine has recently been purchased by C. A. Weed, of this city, and Hawkes, Pratt & Co., of New York. Their borings have extended over a great number of acres, and the salt rock is found everywhere, from fifteen to twenty-two feet below the surface. At the point where the principal excavation was made, the pits have been sunk through the salt to the depth of over forty feet, without finding any indication of reaching the bottom. It is supposed that the mine covers at least one hundred acres, and there is at present no means of ascertaining the depths of the deposits. A number of dwelling-houses and extensive stables have already been completed on the island, and a large building is now in process of construction over the main entrance, which is to contain the steam-engine, mills, crushers, &c. In one week ten inexperienced hands recently got out 200,000 pounds of salt—nearly four tons per day to each hand. What will be the product when all the contemplated mechanical agencies are put into effective operation?

An analysis made by Dr. J. L. Riddell, of New Orleans, gives the following result:—

I find the samples of rock salt furnished by you from the Petite Anse Mines, Attakapas, La., to contain in one hundred parts by weight:

Chloride of sodium (common salt)	98·88
Sulphate of lime (gypsum)	0·76
Chloride of Magnesium	0·23
Chloride of Calcium	0·13
Total	100,00

Nothing else present in quantity to be appreciated. This salt is white or colorless, and visibly consists of impervious aggregations of irregular cubical crystals of common salt, averaging a quarter of an inch in diameter. It attracts no

moisture from the atmosphere. I am not aware of any mine of rock salt hitherto discovered of greater purity and higher intrinsic value.

J. L. RIDDELL,
Professor of Chemistry.

Drug. Circ., May, 1866.

SALT IN IDAHO AND NEVADA.

A correspondent of the San Francisco *Bulletin*, writing from Soda Springs, Idaho, says:—This community are at present deeply interested in the workings of the Oneida Salt Company, a corporation duly formed under the Territorial laws for the purpose of manufacturing salt, with a capital stock of $1,000,000, divided into 1,000 shares, and pocketed by a few original locators. The Company, I understand, have commenced operations upon a large scale. The grounds of this company are situated upon the Lander Cut-off Emigrant Road, about 250 miles north from Salt Lake City, and about 60 miles north from this place. I have conversed with Messrs. Penwell & Stump, the President and Secretary, and learn that upon their land are situated a number of large springs, with a flow of about 150 inches of water, which, after a thorough test, have been found to yield one-third pure, fine table salt when boiled. The Company have erected works to produce 100,000 lbs. per month. The expense which will necessarily accrue in the manufacture of this amount will not exceed one quarter cent per pound, and for which there is a natural market in the mines of our sister Territory, Montana, with a nett profit of not less than ten cents per pound. These springs have been known for years—emigrants passing over that road having spoken of them in the highest terms, and a mere lack of energy has permitted them to be unappropriated. The consumption of salt in mining counties is very great, and the productions of the springs will supply the demand. The mineral wealth of this country is yet undeveloped, but will not be so long. Many prospectors from a distance have already found their way hither with the determination of thorough examination in the early spring. A number of mines (placers) are now being worked in and about Salt

Spring and Pleasant Valley, though their owners have sufficient presence of mind to keep their immediate whereabouts secret; but, suffice to say, the spring and summer will make a thorough exposition. There is no doubt that this country (South-eastern Idaho) will soon equal Boise and Ruby districts in mineral products.

The *Reveille* says: The subjoined notes of a trip hence to Silver Peak by Mr. Scrimgeour, will be found interesting. The distance between Austin and Silver Peak is 156 miles nearly due south. After passing through the canon on the summit, the roads are remarkably good. The descent from the summit to the great south basin is gradual up to within five miles of the point, when it increases rapidly. We estimated the basin to be about 1,000 feet below Smoky Valley. This remarkable salt basin lies ten to twelve miles west of the Peak—a prominent point in the mountain range containing a plain twenty-five miles long with an average breadth of five miles. It is surrounded on all sides by high ranges of mountain, and its margin is as smooth as any sea beach. Viewed from an elevation, it resembles a frozen lake, with its surface covered with snow, and the illusion is aided by several masses of limestone—its icebergs—rising from its surface to a height of about 200 feet. The surface of the basin has a coating of salt nearly six inches thick. A portion of the northern end is now covered with water, which, however, becomes dry in summer. Near the western shore of this lake or basin there are two large boiling hot salt springs—one of which is very active—producing an inexhaustible supply of salt in large beautiful crystals. This valuable property belongs to the mill company which had the spirit and enterprise to pioneer that section of the country.—*Drug. Circ., May*, 1866.

ON SOME PROPERTIES OF FORMIC ACID.

By M. F. V. Jodin.

Beer yeast and many other cellular beings belonging to the simplest types of the fungi family may be classed between the animal and vegetable. As vegetables they extract their nitrogen

from ammonia and nitric acid;* but they cannot, as animals, assimilate carbon, unless it is offered in the state of a ternary compound.

It is now four years since I proposed fixing the limit of the synthetic power of these beings—that is to say, to find out which was the most simple ternary body which could furnish them with assimilable carbon. Experiments have shown that nearly all ternary compounds of vegetable or animal origin, sugars, tartaric, succinic, acetic, oxalic, &c., &c. acids, can each separately, by its association with ammonia, phosphoric acid, potash, &c., form mycogenic media, in which, under certain conditions, organized productions will develop, at the expense of the ternary compound. Formic acid forms the sole exception, and for that reason merits a special study, which I have but recently been able to undertake.

I first proved afresh that formic acid, free, or neutralised by an alkaline or earthy base, associated with the mineral elements PO_5, NH_3, KO, &c., cannot produce a mycogenic liquid. I have kept similar preparations for more than six months, without the appearance of the least organized production altering the perfect limpidity or the chemical composition of the liquid. In this respect formic acid differs from all other ternary acids, including oxalic acid, which, under these conditions, when the solutions are not too much concentrated, and their acidity sufficiently attenuated by the addition of a base, will give organized productions.

These first experiments seem to show that the molecule of formic acid was incapable of furnishing carbon assimilable to the simplest cellular organisms. I wish to find out whether this assimilation could not take place indirectly, as by attraction, associating, in the mycogenic medium, the formic molecule with one more condensed, for instance sugar.

I have, then, made some mixtures, in which the carburetted element, instead of being, as before, simply formic acid, was an association of nearly equal parts of sugar and formic acid, *combined* with lime or an alkali. Similar mixtures have been found highly mycogenic, and have given abundant results. By suffi-

* As regards nitric acid, I am not quite decided on this point.

ciently prolonging the experiment, it will always be found that a more or less considerable portion of the formic acid will have disappeared during the vegetation. Sometimes even, it will have entirely disappeared. Is this disappearance of formic acid due to true assimilation? or to a phenomenon of extra-organic oxidation, analogous to that which takes place during the acetification of alcohol, under the influence of the formation of mother of vinegar? This is a question which my experiments have not yet been able to solve.

I have in the above italicised the word "combined," because, in fact, the mixed preparations remain perfectly sterile if they contain a very small proportion of free formic acid. I have proved that a thousandth of free formic acid is sufficient to keep solutions of sugar from altering, though very mycogenic without this addition.

This property is remarkable. I ascertained that it does not depend on a purely chemical action by establishing a comparison between perfectly similar preparations, except that the formic acid was replaced by an energetic mineral acid—hydrochloric acid—the greatest quantity being five to six thousandths. After a certain time these preparations produced mycoderms, much less rapidly, it is true, than in unacidulated solutions.

I sought another comparison in phenic acid or phenol, and found that by putting side by side mycogenic sugared preparations, to which I added in one case from one to two thousandths of formic acid, and in the other an equal proportion of phenol, the former nearly always remained unchanged.

This was not the case with fresh muscular flesh. Having placed three pieces of beef, weighing each about 30 decigrammes, in three bottles containing, the first 200 cubic centimetres of water with a thousandth of phenic acid, the second 200 cubic centimetres of water and a thousandth of formic acid, the flesh was preserved a relatively much greater time than that of the two others; that in the water acidulated by formic acid putrefied much more slowly than that in the distilled water and presented peculiar phenomena. Thus, the liquid surface was covered with a thick mycodermic layer, which was not the case with the two others. After some time the three liquids pre-

sented an alkaline reaction. This explains why the preservative action of the formic acid lasted a much shorter time than that of the phenol, since, according to the preceding observations, formic acid exercises this power only when free, while phenol, on the contrary, can exercise it as well in a slightly alkaline medium.

From the rank occupied by formic acid in the series of organic compounds, these facts seem to me to bear on the most important problems of natural philosophy. By many this acid is regarded as the first of a long series of products engendered by the reduction of CO_2 in the vegetable organism, while it is really the key to the artificial synthesis so brilliantly developed by the works of M. Berthelot. For these reasons the study of its chemical and physiological functions is necessarily of great interest.—*Lond. Chem. News*, April 13, 1866, from *Comptes Rendus*, lxi., 1179.

ON PHARMACEUTICAL HERBARIA.*

By Daniel Hanbury.

That the well-educated pharmaceutist should possess a certain familiarity with the plants employed in medicine and especially with those indigenous to his own country is a proposition upon which there can scarcely be any difference of opinion. The effort of mind and habits of observation brought into requisition in order to obtain such knowledge, are in no small degree beneficial; while the agreeable reminiscences called forth by an inspection of the plants gathered in years long passed, are such as may well repay the trouble of forming and preserving an herbarium.

But it is not the formation of a general herbarium or even of an herbarium of British plants, interesting and valuable though

*The culture of Botany by Pharmaceutists in the United States is sadly neglected. Even most of the Colleges of Pharmacy do not insist on Botany as one of the sciences indispensable to the course of instruction. The ready accessibility of wild plants, many of them in our Materia Medica, and the great pleasure accruing to the student from their collection and study, are reasons alone sufficient to attract their attention to practical Botany; and we reprint Mr. Hanbury's remarks, intended for the English student, as appropriate here. Ed. Amer. Jour. Pharm.

they are, that I venture now to advocate. I wish rather to point out the advantage to the student of being able to consult a small collection of medicinal plants preserved in herbarium-form, and to draw attention to the ease with which such a collection may be formed. One of the regulations imposed by a paternal but despotic government on the continental apothecary is that he shall provide and maintain in good order for the use of his apprentices, an herbarium of medicinal plants. Let us draw a lesson from this. In the British Pharmacopœia about 170 plants are enumerated as furnishing the vegetable Materia Medica prescribed in that work; and of this number more than 50 are either indigenous to or are cultivated in Great Britain. An herbarium comprising even four-fifths of this number would be no unimportant aid to the student who was "reading up" a subject so uninviting to most as Materia Medica. I would not however restrict my herbarium to the plants of the pharmacopœia. There is a considerable number that are used in rustic medicine, some of which were held officinal by the London College of Physicians but a few years back. As instances of this, let me enumerate Woodsorrel, Sweet Flag, Garlick, Marsh Mallow, Asarabacca, Bistort, Bitter Cress, Lesser Centaury, Quince, Carrot, Black Hellebore, Elecampane, Lettuce, Bay, Common Mallow, Horehound, Pennyroyal, Wormwood, Buckbean, Tormentilla, and Coltsfoot. To this number may be added with advantage certain plants which are interesting to the pharmaceutist from their liability to be confounded with others that are officinal, as *Pyrethrum* and *Matricaria*, which may be mistaken for Chamomile, Fool's Parsley, supposed sometimes to do duty for Conium, Hawkbit and *Rhamnus Frangula*, which it is said have been passed off for Dandelion and Buckthorn.

As to exotic medicinal plants, the difficulty of obtaining specimens would, I must admit, be far greater and the pharmaceutical herbarium must inevitably contain many blanks. Still as the Pharmaceutical Society numbers over 40 members resident in foreign countries, it would not, I believe, be impossible to interest some of them in procuring and forwarding to our secretary specimens for distribution of some of the commoner

economic plants occurring in their respective districts. In this way our pharmaceutical herbariums might be enriched with such tropical plants as the Clove, Cinnamon, Allspice, Cassia Fistula, Pareira Brava, Quassia, etc.

One of the more complete herbaria of the character I have attempted to describe, ought to be preserved at Bloomsbury Square, and others in the rooms of the Branch Societies at Edinburgh, Liverpool, etc.; but in addition I would suggest to those who feel or wish to feel interested in botany, to commence themselves the formation of an herbarium of medicinal plants, taking as a nucleus those commonest plants of our gardens, fields, hedge-rows and commons, the Cherry-Laurel, Lavender, Dandelion, Bittersweet, Elder, Foxglove, etc.

It is unnecessary here to describe the simple operation of preparing botanical specimens (an operation for which a pharmaceutist has several facilities); but a few words may be said on the best method of mounting them so as to render them at once convenient for reference, and as little liable as possible to sustain injury from handling and from the depredation of insects. In the first place it should be a rule that no specimen should be mounted unless previously brushed over with an alcoholic solution of Corrosive Sublimate, a precaution against the ravages of a certain mischievous little beetle, extremely ready to prey on dried leaves. Specimens having been subjected to this operation, should be re-dried with slight pressure and are then ready to be fastened to the paper on which they are to be ultimately preserved. This may be done simply with short, narrow strips of paper, gummed or glued so as to hold down the stems and more prominent parts. Specimens thus fastened can be readily removed, when it is desirable to replace them by better; but for an herbarium that is to be frequently handled (and by others than its owner) it is preferable to resort to a method of attaching specimens still more secure, and this is conveniently effected by the use of common glue brushed while hot over at least a portion of the specimen. Strips of gummed paper may be conveniently used in addition for the better securing of woody stems, roots, bulbs, and such like. The paper on which specimens are mounted should be good and

stout, and in oblong pieces measuring about 17 inches by 10. The usual method of putting by mounted specimens is to place them loose in brown-paper covers, which are afterwards arranged one above another in the pigeon-holes of a cabinet. For an herbarium specially pharmaceutical, comprising as it necessarily would but a limited number of specimens, a large book, made so as to open flat, would probably be even more convenient than the ordinary loose sheets in covers. The specimens would be retained in proper sequence, and be more compact and manageable than if upon separate sheets. Some well-arranged volumes of this kind would afford much of the benefit to be derived from engraved figures :—in fact in many cases, the examination of an actual specimen is far more impressive and informing than the inspection of a plate. The authors of the British Pharmacopœia have carefully mentioned in what works figures may be found of the several plants enumerated in that volume. The number of works thus referred to is twenty-six; many of them are of great rarity and quite inaccessible to the majority of persons who would wish to consult them,—while to purchase the whole series a sum would be required approaching £230.

I trust I have said sufficient to show that the formation of herbaria of medicinal plants is a subject that merits some attention at the hands of the Pharmaceutical Society.—*Lond. Pharm. Jour.*, May, 1866.

ON YELLOW WAX COMPARED WITH WHITE, AS A CONSTITUENT OF CERATES, &c.

By Ferris Bringhurst.

Having for some time theoretically believed in the superiority of selected yellow wax over white wax, in making cerates, ointments, suppositories, &c., and having practically and thoroughly tested this theory, I am so well convinced of its correctness, as to be strongly tempted to depart from the strict letter of the Pharmacopœia, and use the yellow to the exclusion of the white, in all compositions, officinal and non-officinal, of which wax is a constituent.

About eight months ago I made some simple cerate, using

yellow wax, for exhibition at the last meeting of the American Pharmaceutical Association, a specimen of which is on the table, and will be found to have kept well, and in fact is as good, if not better, than the specimen of officinal cerate made about six weeks since.

I have used yellow wax for several years in making "Glycerin Cream," and have never known it to spoil, while in "Cold Cream," made with white wax, the change of age is readily detected. This difference is no doubt due in part to the preservative influence of the glycerin.

In making suppositories, I have for a long time used the yellow instead of white wax, for giving proper consistence to the cocoa butter, and find a decided advantage.

In the former case, the original chocolate odor is well preserved, while in the latter there is a rank odor, like that of stale, burnt coffee.

About two years ago, while the armies for and against the Republic were contending about Spottsylvania, I was one of a Committee sent from our city to Fredericksburg to care for the sick and wounded. Having a knowledge of medicines, I was at once assigned as Hospital Steward in the main hospital of the Second Corps, then actively engaged. Large supplies of dressing were required, and I had occasion to open and inspect many cans of simple cerate, some bearing the labels of eminent houses here, others that of the U. S. Army Laboratory; all, no doubt, made according to the officinal formula, and of selected materials; but there was scarcely any of it I considered fit to dress sores and wounds, requiring a bland cerate free from irritating qualities, as the "Ceratum Adipis" is intended to be. Let us for a moment compare the virtues of the two.

Selected yellow wax, having been subjected to but one simple manipulation, contains a trace of honey, to its advantage rather than otherwise, a peculiar balsamic principle, which gives it a delightful odor, and tends to preserve not only the wax, but all its compounds also, and a yellow coloring matter which is considered its objectionable feature.

Commercial white wax, having passed through several manipulations, nearly always contains a considerable portion of tallow,

paraffine, or other sophistication, is deprived of all its honey, and nearly, if not quite all its balsamic principles, and is so deteriorated by the bleaching process, that a slightly rancid odor is nearly always observable, and, in my judgment, it produces a strong tendency to rancidity in all its compounds. It has no particular advantage over the yellow, except in point of color, which is a very doubtful advantage, considering the sacrifice of useful features peculiar to the latter.

What does the suffering patient care for the color of an ointment, if it is adapted to his case and heals his wound? And I would ask what good and sufficient reason is there for throwing aside the peculiar virtues of yellow wax, and making a really inferior cerate, liable to constant deterioration, in order to have it white?

Mr. Maisch said that he had no practical experience with the substitution, in ointments and cerates, of yellow for white wax. Mr. Bringhurst had referred to the rancidity of all the simple cerate made by private parties, and at the U. S. A. Laboratory, which he saw on the battle field. The speaker said, however, that he had examined many samples of so-called simple cerate used by the army, and had found quite a number furnished by houses considered respectable, which did not contain a trace of wax, which was substituted by Japan wax and paraffine. This fraudulent preparation is easily recognized by its semi-transparent appearance, while true simple cerate is opaque. Japan wax is a fat, usually more or less rancid the way it appears in commerce, and must, therefore, necessarily hasten the decomposition of lard. Paraffine renders lard rancid still more rapidly. These facts account in part for the experience of Mr. Bringhurst.

Some private houses had furnished to the army true simple cerate, and all made at the U. S. Army Laboratory in this city was prepared strictly according to the Pharmacopœia. In 1863, shortly after the Laboratory went into operation, the speaker had met with some difficulty in obtaining pure lard, the commercial being found to contain a fraudulent admixture of from 12 to 16 per cent. of water. Subsequently, however, pure lard was prepared by the manufacturers for this institution. Although the material was used strictly in the proportion of the

National Pharmacopœia, still the manipulation differed somewhat from that followed by Pharmaceutists on the small scale. The material was fused by steam, then stirred until it became so thick that, on being run into cold tin cans, it would congeal in a few minutes. Made in this way, it was not quite as white as usually met with in apothecaries' stores; but a thin layer on the surface, containing more wax, and being firmer on that account, rather tended to counteract the tendency to become rancid; and he had repeatedly examined some, several months after its preparation, and, though a slight odor of incipient rancidity was observed, this decomposition had not proceeded far enough to unfit it for surgical use. From 800 to 1200 lbs. were frequently run off in one day.

Mr. Bringhurst said that he had no doubt that the simple cerate, like all other preparations made at the U. S. Army Laboratory, were prepared in accordance with the Pharmacopœia; but he had opened a great many packages issued from that institution, and found them all rancid, and, in his opinion, unfit for dressing wounds.

Mr. Maisch. Early in 1863, he had proposed to make simple cerate with yellow instead of white wax, as probably furnishing a preparation not so prone to change as the officinal; but the surgeons, who had to decide upon it, would not entertain the proposition, because the preparation would be so different in appearance from that with which the surgeons of the army were familiar, that it would be returned. There was, however, one reason which easily accounts for the rancidity of the simple cerate as met with in the general hospitals and on the battle field. Mr. Henry N. Rittenhouse, who is present at this meeting, and who has acted as Medical Purveyor during a considerable period of this war, has had practical experience in the mode of furnishing medical supplies to the army, and could give better information on this point than the speaker. Towards the close of a quarter, the Laboratory would endeavor to have a stock of all preparations on hand to fill the requisitions of the various medical purveyors, who made theirs three months in advance. The surgeons in charge of general hospitals likewise made their quarterly requisitions three months ahead, and they were usually

filled by the purveyors from the supplies received during the previous quarter. It will be seen that six to nine months might have elapsed before the medical supplies reached those points where they were to be used, and that nine to twelve months might pass away before they were all used. This is entirely too long a period to preserve simple cerate, which is rendered still more inclined to change by the heat of our summer.—*Sec. Ann. Rep. Alumni Assoc. Phil. Coll. Pharm.*

ON THE PRESERVATION OF MEATS BY PARAFFIN.

By Prof. Redwood.

Mr. John Mackay brought before the meeting a new method of preserving beef, mutton and other animal substances used for food in a perfectly fresh condition, free from salt or any other ingredient likely to interfere with the flavor or condition of the material so preserved. Mr. Mackay stated that the discovery of the process about to be submitted was due to Dr. Redwood, who, in the course of last summer, commenced a series of experiments with paraffin, in, of course, a state of purity. The following peculiarities of this substance were referred to, viz., its solidity, whiteness, tastelessness and entire freedom from smell. At a heat of about 130° it becomes fluid, and will, in this condition, bear a considerable amount of heat without boiling, and thus enables the experimenter to raise the temperature, if required, several hundred degrees above 212°, the boiling-point of water, without in any respect altering its condition. It was found that animal substances, when immersed in a bath of paraffin heated to about 250° F., rapidly lost the air and water which all such substances contain, leaving the juice of the meat in a concentrated state. Mr. Mackay explained how this was done. According to the thickness of the mass of meat, the time of its immersion is increased or diminished. By this process, the germs of destruction are found to be quite destroyed, very much on the same principle that the various articles of food are prepared in hermetically sealed vessels, or calf-foot jelly bottled and kept in a perfect state of preservation. When the meat has thus been allowed to remain a sufficient length of time

in the highly-heated paraffin, it is removed, and immediately dipped into a bath containing the same material, at a lower temperature, and, after two or three dippings, the process is complete. Already various samples have been prepared, and, after three months' keeping, have been cooked and found perfectly sweet, and free from any taint whatever. So successful has the process been, so far as it has been tried, in connection with experiments commenced last summer, that a company has been formed in London, under the name of "Redwood's Patents Company, Limited," where experiments are still going on with a variety of different substances—such as bacon, beef, mutton, butter, eggs, sausages, cheese, hams, etc. The Company, having secured patent rights on the Continent and in South America, hope that, ere long, choice beef and mutton will be sent home to Great Britain in a perfectly fresh state, and be sold at such prices as must of necessity prove a boon to the public generally, but more especially to the poorer portion of the inhabitants in this country. Mr. Mackay submitted to the meeting several specimens of meat prepared by the new process, including a jigot of mutton and several chops. These looked very beautiful, resembling in appearance the purest alabaster, and, though handled a good deal, remained unchanged. Some of the samples shown had been prepared five weeks, and Mr. Mackay stated that one cooked a few days previously was perfectly sweet and fresh. The following are the directions by which the preserved meat may be cooked:—"Remove the greater part of the paraffin by breaking it with a hammer or other suitable instrument, and peeling it off; then put the meat into a vessel of boiling water, when the remainder of the paraffin will melt and rise to the surface, leaving the meat entirely free from it. When it has cooled, the hardened paraffin may be taken from the surface of the water, and the meat dried with a cloth. It is now ready to be prepared for food by any of the usual methods, but it should be cooked for only half the time required for unpreserved fresh meat. The paraffin that has been removed from the meat may be kept for subsequent use, being quite unchanged or injured in any way." In closing his remarks, Mr. M. mentioned that further experiments were

being vigorously carried forward at the works of the company, near London, which, if successful, would be the means of bringing the process into very general use.—*Trans. Pharm. Society, Edin.*, in *Pharm. Jour.*, *May*, 1866.

NEW ELECTRICAL MACHINE.

To the Editor of the *Chemical News*.

Sir:—Since my last communication to you I have turned my attention from chemical to electrical science, and seem to have discovered an inexhaustible magazine of electricity in wood! Not that I imagine for a moment that I have made any "discovery," but rather the application of one; for who is there that does not know that dry wood insulates? while how few, if any, are aware that sparks may be drawn from its surface equal in quantity and intensity to those from "ebonite"—and even longer! If this be so, it ought to make a revolution in the price of electrical machines, for wood would only cost a twentieth the price of any other electric.

Besides cheapness, wood presents many other advantages—viz., stiffness, lightness, portability, surprising power and size; for it is evident that if this material can be put together so closely as to form but one piece, and as easily taken asunder, there can be no limit—save the growth of timber—to the construction of the most powerful machines. Enormous electrical "jars" also might readily be constructed of this material, if they should ever be required. But the great value of wood consists in its being rendered capable of remaining permanently electrical, and, therefore, permanently dry, without which its great power would count for next to nothing.

Brown paper, which, while hot and dry, exhibits equal powers, is nothing directly it is cold; while wood, which appears equally porous, retains indefinitely its electric properties. How is this? I have by me pieces of different kinds of wood, which, to my certain knowledge (after baking) have not been near any fire for two months, and yet they exhibit all the intensity of recent dessication. This great power seems to reside in the woody fibre; for if, while still hot from the oven, we coat the wood with

copal varnish, on drying, it does not show near the same power, and, what is rather difficult to understand, after the lapse of a few days, seems no more electric than wet wood, while the simple wood remains so. Oil, I believe, is supposed to attract a small quantity of moisture from the atmosphere, but how can it do so when the varnish is dry and the oil solid? Machines formed of wooden discs coated in this manner were described in the time of Ingenhouz, and that was my original intention, when, on taking the piece of wood from the fire, I thought I would just see if it were capable of itself (before varnishing) of showing attraction on rubbing, when lo! a strong spark flies off. I recollect, some ten or twelve years ago, when at school, (reading of the power of brown paper,) attempting to form a cheap machine of wood, covered with brown paper, and thought it very hard I couldn't get the slightest spark, heat or rub how I might, little imagining at the time that the wood only wanted drying to form itself the best substance. As a rubber, I employ catskin; but either (unvarnished) silk, or, still better, "vulcanized India-rubber," answer equally well. I have late mounted my machine with wooden discs, in the place of ebonite ones, and the effects must be seen to be believed. Now, if this is anything new to you, sir, perhaps you might wish to see such an instrument, in which case, you might call any day between ten and four o'clock, or else it might be sent to your address. Can you suggest any means of rendering wood permanently as well as absolutely dry? I carry on the "baking" or drying till the surface is slightly colored, but not "carbonized," in which case, at the end of two months, it appears equally electric as the first day, and that in spite of a small quantity of steam when put before the fire.

I am, &c.,
F. E. S. JERNINGHAM.

52 Cambridge Terrace, March 19.

—*Lond. Chem. News, March* 23, 1866.

New Electrical Machine—Electricity of Wood.

The communication from Mr. Jerningham, which we printed in our number for March 23, was, we are sorry to find, not intended

for immediate publication. The writer, however, now kindly sends us further information on the subject, which is of great value. We have only to add that a machine on this principle was exhibited at the last *soiree* of the President of the Royal Society, and attracted much attention.

To the Editor of the Chemical News:

SIR:—The only additional information which I am able at present to supply on the subject of the electricity of wood has reference to the different capacity of different kinds of wood of being converted into electrics, and here I would caution any one who may feel tempted to repeat the experiment to bear in mind that though it be true that every kind of wood which I have yet examined would appear capable, more or less, of this conversion, yet that time is a singular and indispensable condition of this transformation, and that wood can no more be rendered "electric" by holding it to the fire for "a minute or two," than toast is dried because it happens to be colored. It requires "doing," like meat; and I never think of giving less than from one to two hours. And not only does it take some time, but, in general, a strong heat as well; and as for tulip wood, and perhaps one or two other very hard woods, they obstinately refuse to become electric for whole hours. After three hours, no change could be perceived, till at length, between four and five hours, of a temperature just short of actual carbonization, this variety then gave pretty strong sparks, and retains its power well.

The following are among the specimens of wood which I have as yet examined, though, doubtless, there may be many more that might with advantage be submitted for trial:—Pine, white deal, mahogany, cedar, English oak, box, English birch, Hungarian ditto, ebony, satin, white holly, pear, rose, tulip, purple wood and king wood; likewise, "pencil cedar," American walnut, English ditto, Japanese oak, common elm, (witch elm,) partridge wood, (heart and sap,) birds' eye maple, sycamore, acacia, yew, lime, sweet chestnut, horse chestnut, lignum vitæ, (heart and sap,) cocoa, black thorn, "Amboyna" fir-tree, lance, American birch, and "raspberry wood," so called from its strong odor resembling strawberries. A specimen of wood, "name not known," but much resembling the Zebra variety,

only much denser and heavier, was also heated, and which was the only one that was characterized by its cracking and splitting in all directions. White deal would, perhaps, form the best wood for the purpose, could it only be obtained wide enough, because I find it possible to get sparks from it with amalgam, no doubt on account of its hard smooth surface, which, however, speedily becomes coated with metal, and so cannot vie with ebonite on account of polish. Were it not for this, I believe wood would be found equal to it, as under similar circumstances, (as when catskin is used,) the power of each appears equal.

The pieces of wood I speak of were exposed between wire work secured by wire to the influence of a good fire, at from six inches' to a foot's distance from the bars for from one to two hours—during this operation, English walnut and mahogany are very apt to ignite—and, in this way, ten or a dozen pieces may readily be heated at a time, the pieces of wood measuring 8 inches by 4 or = 32, and $\frac{1}{4}$ in. thick.

From this mode of operating, it will be seen that the "comparisons" must necessarily be rather rough and only approximate, though the pieces were so arranged as to be heated both sides as nearly equally as possible. Of course, had I possessed at the moment required the necessary conveniences, an oil bath would have given more reliable results; but still I consider the comparison sufficiently near the truth to prove useful. I have already dwelt upon the necessity of heating the woods a sufficient time, &c., because such directions are necessary to success, and without them it often comes to pass that in the hands of another statements and results can no more be reconciled in truth than can those of "Geology" and "Religion." But to return to the woods. The first batch were examined after three weeks or more, and the second after one—a mere matter of accident. Of the whole list, but a very limited number retained anything like all their pristine vigor. Among these may be mentioned rosewood, satinwood, kingwood, and perhaps cedar and tulipwood, mahogany not doing so well. Oak was the only wood in which the sparks mostly ran along the surface before discharge could take place, as if it contained metals; while ash (English, if not foreign,) had by this time lost all perceptible

power, not only of giving sparks, but even of attraction upon the lightest bodies! This applies also to oak, "pencil cedar," horse chestnut, "Amboyna," black thorn, sycamore, and perhaps lime; while the rest retained their power very well, as sweet chestnut, acacia, fir, white deal, lignum vitæ, &c., &c. Most woods appear to keep their form pretty well this size, and to be but little affected by the heat as regards "warping," with but two or three exceptions, as boxwood, lignum, &c., and one or two others. As for "hornbeam," it was literally doubled up. When I stated that wood presented more powerful appearances than ebonite under similar circumstances, I referred simply to the phenomenon presented by the former when two eighteen inch discs were laid one upon another, and then rubbed gently with catskin, hareskin or rabbitskin a dozen times or so; if the uppermost plate be now raised, and the knuckle presented, the discharge takes place in a single spark of great length and high intensity, while with the ebonite circulars the sparks appear much shorter, though in larger quantity.

In conclusion, I may remark I have always observed that the hardest and driest woods—showing no visible trace of moisture—invariably take the longest time and strongest heat; and this circumstance, in connection with the fact that I have very frequently obtained very unequivocal sparks from such a wood as pine while still strongly steaming before the fire, would seem to warrant the supposition that this curious conversion of wood, by long-continued heat, into an electric might depend upon something more than the mere and simple abstraction of water.

I am, &c.,

F. E. S. JERNINGHAM.

52 Cambridge Terrace, Hyde Park, April 27, 1866.

—*Lond. Chem. News, May* 11, 1866.

HINTS TO DISPENSERS.

By SAMUEL TAYLOR.

The subject naturally divides itself into two parts, viz.: Hints to the Head, including all those qualifications of *mind* and *temperament* which fit a man for becoming a good dis-

penser; and Hints to the Hands, under which head a few suggestions may be offered touching a general manipulation of a prescription.

Under the first of these divisions, it will be well to observe that a good general education is perhaps the most essential qualification. A dispenser's writing should be clear, distinct, and neat, at least; so that no blame may attach to him, for mistakes in reading his directions. His orthography and acquaintance with "Murray" should be unimpeachable, so that patients may not have their faith in his medicines rudely shaken by any fault of his on this score. A good practical knowledge of figures, especially the multiplying and dividing of fractions, will be of a great service to himself, and is necessary to the safety of those who have to take strong preparations coming from his hands. Under existing circumstances, *i. e.* whilst the Pharmacopœia are wholly or partially, and physicians' prescriptions almost entirely written in *Latin*, it is important that the dispenser will be at least well grounded in that language. The stigma so often laid upon us as a class, that ours is a system of "Dog Latin," is owing to a deficiency in this branch of education amongst us, and is one that comes within the province of associations like this to remove, by establishing classes for the better instruction of the younger portion of the profession in the Latin language.

The next qualification, under this division, necessary to a dispenser, is a good knowledge of chemistry and Materia Medica; of which two subjects, the more he knows, the pleasanter will be his duties, and the higher the position he is likely to attain amongst his professional brethren and in the world.

Posology is another branch of information in which the dispenser should be well up, as medical men are not infallible, but, like the rest of humanity, sometimes liable to err. He should therefore be able at a glance to detect an over-dose, and thus act as a check betwixt the doctor and the patient. These are qualifications of mind which can only be acquired by assiduous attention, but which must nevertheless be attained ere the dispenser can practise his calling either with comfort to himself or safety to his clients. There are, however, certain other mental qualifica-

tions, which, though not absolutely essential to the compounding a prescription, are yet highly important, and deserving attention. The most important of these perhaps is caution, from the want of which so many sad accidents have occurred, spreading dismay throughout the profession and the country. This caution or care need not interfere with dispatch in dispensing; for many dispensers, by the power of concentrating their thoughts upon the one object then in hand, have been remarkable for their quickness as well as correctness in dispensing. A few aids to correctness may here be mentioned:—that of copying prescriptions prior to making up the medicines or writing the labels, whereby the general meaning and composition of the prescription is impressed on the mind; that (where practicable) of having all medicines prepared by the dispenser, checked and sent out by either the master or another assistant; that of having the measuring of all powerful remedies, as tr. aconiti, tr. nucis vomic., preparations of hydrarg. oxymur., etc., when ordered for internal administration, witnessed. There is further, the now generally adopted arrangement of a chemist's shop, so that the dispensing of medicines is kept quite apart from the retail counter. In shops where the stock-bottles are exclusively stoppered, a tin cap fitting loosely over the stopper would probably form a sufficiently distinctive feature to distinguish poison-bottles from ordinary ones; or if caps be the covers for many of the ordinary bottles, then a different-shaped one might be used for the poisons. Still these are but aids, and the great security against accident lies in the concentrated attention of the dispenser. Quickness of perception, or a readiness to understand the general interpretation of a prescription; coolness, or a collectedness of mind under a heavy pressure of work, are also qualifications worth the cultivating.

Under the second head it may be just remarked at the outset, that a quick eye and delicate nose are both useful as checks and tests. Medicines, as generally prescribed in this country, may be classed under one of the following divisions:—liquids, comprising mixtures, lotions, liniments, gargles, etc.; pills and powders; ointments and plasters. The first class will demand the largest share of attention. In compounding medicines,

avoid using a mortar as much as possible, thereby preventing unnecessary trouble and straining, as liquids very rarely come out of a mortar in the same condition as they entered it. Many of the soluble salts, such as bicarbonate of potash, bicarbonate of soda, Rochelle salts, etc. (if of the best make) are perfectly and readily soluble in ordinary aqueous vehicles, yet how common the practice of rubbing them down in mortars, thereby running the risk of contaminating them, besides losing time. The heavy carbonate of magnesia and trisnitrate of bismuth may also, as a rule, be slipped into the bottle, without the necessity of dirtying a mortar. All soluble scaly preparations dissolve more readily in the bottle than by rubbing in a mortar. On the other hand, there are many cases in which the use of the mortar is absolutely necessary to the production of an elegant mixture; as when bulky powders are prescribed, which must be gradually rubbed up with the liquid; also when considerable effervescence takes place in mixing; when hot water is required for solution; when crystals are to be broken down and dissolved, or rubbed up when insoluble. When extracts are ordered in mixtures, the readiest means of dissolving them is by working them into a smooth liquid paste on a slab with a palette knife, and then scraping off into a measure containing more of the vehicle, and gently mixing with the knife. Oil of almonds and olive oil, when ordered with liquor potassæ, form a very nice emulsion, by diluting the alkali freely, and shaking the two together. When compounding a mixture containing ingredients which act chemically upon each other, it is advisable to keep them as far apart, and as much diluted, as possible. Chloroform, creasote, and essential oils, should, if any tinctures are present, be dissolved in them prior to being added to the mixture. In rubbing oil of cubebs or other essential oils in large quantities with mucilage, great care is necessary to avoid an insoluble compound forming: this may be prevented by judicious diluting during the process. Gallic acid should be dissolved in hot water, as also should quinine, if there be no other solvent present; but care must be taken to ascertain that there is not more of either than the mixture will afterwards retain when cold. Tincture of benzoin, tolu, and other gum-resin tinctures, should be added to mixtures nearly at

the last, and immediately shaken gently. Hydrocyanic acid should be added last of all. Nitrate of silver, diacetate of lead, and other salts decomposed by ordinary water, should be dissolved in distilled water.

The following queries may here be put:—What does a medical man intend when he expresses the quantity of any powerful medicine in a mixture by the term *guttas?* Does he really mean drops, or is he under the impression that the difference between drops and minims is so trivial as not to necessitate his particularizing? When the term "ad Octarius" occurs, which is intended, a sixteen or twenty ounce mixture? Is it generally understood that unless the prescriber specifies P.B. he means P. L?

The next class to be noticed, are pills and powders. With respect to the latter, the best mode of obtaining a uniform admixture, perhaps, is, by weighing and rubbing well together the smaller quantities first, and then adding the larger ones gradually; and in cases where large quantities of bulky powders are ordered, by sifting. As to their division into separate doses, probably a practised eye may be more safely trusted than many a pair of dispenser's scales.

Pills should be kept as small in size as practicable. In order to this, some of the soft extracts in general use might be kept dried down ready for making up, or in the case of those seldom required, by evaporating them on a small pill tile in front of an ordinary fire. Rhubarb should be made up with some thin liquid, and as much added at once as will be sufficient to make up the mass. Quinine pills may be kept down in size by reducing the quinine to a fine powder before attempting to make up.

Some substances are very difficult to incorporate. The sulphates of zinc and iron should first be reduced to fine powder, and confection of hips (that sheet-anchor of the pill-maker) be used to bind them into a mass. Creasote and essential oils are rather troublesome things to get into pill-masses when ordered in large quantities; some recommend their being absorbed by any powder ordered along with them, or added expressly for the purpose; others, that they should be added last; and others,

that they should be made into a mucilage with a few drops of strong solution of gum, prior to being absorbed by the powders. Oxide of silver should be compounded with non-saccharine substances, to prevent deoxidation. Many pill-masses, as the compound galbanum, yield readily to a warm pestle and mortar, when all other treatment fails. The objectionable smell and flavor of valerianate of zinc and other offensive medicines, may be almost entirely covered by a skilful coating of silver leaf or of balsam-tolu.

The next class of preparations—ointments—will not require many comments. They should be made uniform, both in consistency and color, and every trace of grittiness avoided by rubbing down insoluble substances with oil, or dissolving in hot water such as are soluble, as in the case of iodide of potassium and tartar emetic. A metal knife should not be used for ointments containing nitrate of mercury, corrosive sublimate, iodine, or even red precipitate, if the ointment be melted or the knife have to come in contact with the precipitate prior to its being thoroughly mixed in the ointment.

The last preparations to be touched upon are plasters, as regards the manipulation of which more may be learned by one month's practice than by twelve months lecturing. Perhaps the stiff "paper form" may be suggested, as affording a great improvement upon the old system of spreading plasters without one. Also that opium, belladonna and ammoniacum plasters should have an adhesive margin.—*Trans. Leeds Chem. Assoc.*, in *Pharm. Jour.*, May, 1866.

ON CINCHONA CULTIVATION IN CEYLON.

By Mr. Clements Markham.

(Communicated to the Botanical Society of Edinburgh by Dr. Greville.)

Mr. Markham has been deputed by the Government to visit the planters along the western coast of India, and try to induce them to cultivate the Cinchona tree, in order that a new source of supply of quinine may be obtained. He had been visiting and reporting on the Hakgalla Cinchona Plantation, in Ceylon. He says that the site at Hakgalla is well chosen, as closely re-

sembling the habitat of the plants in South America, and he bears testimony to the skill and success with which Dr. Thwaites, assisted by Mr. MacNicol, has conducted the task of cultivating and propagating the quinine-yielding plants. Of the many thousands planted out on a bare slope at Rothschild, exposed to the full influence of light and wind, he also speaks in the highest terms as robust and flourishing. He states that the *Cinchonidæ* in India are pretty certain greatly to excel the parent plants in South America in the yield of valuable alkaloids. So striking is the improvement, indeed, that what are reckoned inferior species in the country to which they are indigenous, vie in their products with the most valuable. It has been proved that not only do the young prunings yield large quantities of quinine, but that by encouraging the growth of Moss and Lichens on the stems, the quantity of alkaloids is increased; and more than this, that if the wounds are at once covered over by Moss, strips of bark, rich in the most valuable of febrifuges, can be repeatedly taken from the same trees without injury to their vitality. Every encouraging element, as far as cultivation is concerned, is therefore present; and to complete the inducements to the Ceylon planters to engage in the pursuit, there will be a market close to their doors. The Government of India, the largest consumers of quinine in the world, are about to establish a manufactory for obtaining the sulphate from the bark, in the Madras Presidency. The red bark of India and Ceylon will fetch as high a price as the *Calisaya* of Bolivia, the most valuable of all the barks (4*s*. per lb.). If the price went down to one-fourth of this sum, we have little doubt the cultivation would pay. The bark could either go to India, or it would be taken at a cheap rate to England as filling-up cargo. Not half-a-dozen years have elapsed since the first plants were introduced into India, and now they are to be found, to the number of at least a million and a half, scattered over the hill-ranges of Ceylon and India, from Hakgalla to the Himalayas—flourishing everywhere, except in the hill hollows, where actual frosts prove fatal to them. The Indian Government consider that the progress in the operations has been very satisfactory, and they congratulate Mr. M'Ivor on the important success that has attended his labors in this national

undertaking. The oldest plants which were planted out in August, 1862, are now from 8 to 12 feet in height, and from 7 to 13 inches in girth at 6 inches from the ground, well furnished with lateral branches, and present a most robust and healthy appearance. In the oldest plantations the branches of the plants, 10 and 12 feet apart, are now touching each other, and the bark is much increased in thickness. The characteristic markings of the finest Peruvian bark are becoming more and more apparent, Lichens and Mosses being fully developed. The plants are flowering freely, and perfect seeds have already been obtained: in short, there is no room to doubt that the Cinchona can be grown on the Neilgherries in great perfection. —*Lond. Pharm. Journ.*, April, 1866.

REPORT ON THE CULTIVATION OF CINCHONÆ AT DARJEELING DURING THE MONTH OF OCTOBER, 1865.

From T. Anderson, Esq., M. D., Superintendent Botanical Gardens, and in charge of Cinchona cultivation in Bengal, to S. C. Bayley, Esq., Junior Secretary to the Government of Bengal, dated the 3d of January, 1866.

I have the honor to transmit herewith the Report of the Cinchona cultivation at Darjeeling for the month of October, 1865.

Report for the month of October.

I am glad to be able to report the continued success of the cultivation. The number of cuttings made during the month was 9615, making a total number of plants and cuttings in all stages of growth 108,962. The alterations in the mode of growing the plants from which cuttings are obtained has been completed for all the species. The full number of stock plants for cutting (10,000) has been attained in the case of *C. succirubra* and *C. officinalis*, but some months must elapse before the number of stock plants of *C. micrantha* is completed.

As I possess only 142 plants and cuttings of *C. Calisaya*, this valuable species must be cultivated under the shelter of glass for some years longer. During the month 14,500 well-rooted plants of *C. succirubra* were planted in open-air beds, from which they will be transferred in April next to the open ground.

2. The first public sale of Cinchonæ took place on the 2d of October. Three purchasers attended, who among them bought the 1000 plants offered for sale at the upset price of four annas each: only *C. officinalis* was sold.

3. The temperature of the past month has been considerably lower than that of September, the greatest difference being in the mean minimum temperature from the clear cloudless nights favoring radiation.

4. The rain-fall has also greatly diminished; only one and a half inches of rain were recorded during the month, making a total fall of 153·08 inches from the first of January. The mean maximum temperature at the fourth plantation was 80·06. The mean minimum 59·19, and the mean temperature of the month 69·62.

5. At the fifth and lowest plantation, nine observations of the minimum thermometer give a minimum temperature of 61·62.

6. This decrease.in the temperature, accompanied by dryness of the atmosphere, has affected the growth of the plants. The period of rest is rapidly approaching when the plants will remain almost dormant.

Number and Distribution of Cinchona Plants in the Government Plantations of Darjeeling on the 1*st of November*, 1865.

Name of Species of Cinchonæ.	Number in permanent plantations.	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted cuttings in cutting-beds.	Number of cuttings made during the month.	Total number of plants, cuttings, and seedlings.
C. succirubra.....	389	10,000	14,500	14,145	4100	43,134
C. Calisaya.....		23		94	25	142
C. micrantha.....	15	2,539		1,426	290	4,264
C. officinalis, including varieties.....	870	10,000	8,459	31,801	5,200	56,330
C. Pahudiana.....	5,092					5,092
Total.....	6,366	22,562	22,959	47,466	9,615	108,962

—*London Pharm. Jour., April*, 1866.

ON THE APPLICATION OF DISINFECTANTS IN ARRESTING THE SPREAD OF THE CATTLE PLAGUE.

Report to Her Majesty's Commissioners,
By WILLIAM CROOKES, F. R. S.

PART I.—*Theoretical Considerations as to the Propagation of the Cattle Plague.*

1. Previous to my receiving instructions from the Royal Commission for inquiring into the origin and nature of the cattle plague, I had devoted considerable attention to the investigation of the applicability of disinfectants to the prevention or cure of this pestilence, ever since its first appearance in England, and had tried numerous experiments both in the laboratory and also on a large scale in farm-yards. I was therefore not unprepared to commence at once the practical operations which it was considered desirable to carry out.

2. As to the bare fact of the infectious* nature of the cattle plague all are agreed. That contamination of some kind is communicated from a diseased to a healthy animal is obvious to every one; but when we inquire by what agency the disease is carried, the answers are of the most conflicting kind. Something, evidently a material substance, passes from one beast to another; but what is this something? Is it a solid, a liquid, or a gas; living or dead; an animal or a vegetable germ; a poison, virus or ferment? Each of these views has found advocates, and in favor of each something may be said.

3. There are weighty reasons for deciding that the infecting matter is neither a gas nor even a volatile liquid. The almost infinite attenuation which a gas undergoes owing to its rapid diffusion into the atmosphere, would render its supposed noxious influence imperceptible a few yards from the focus of infection. Moreover, the infection is capable of being carried considerable

* I have throughout this Report used the word "infectious" in preference to "contagious." The limitation to actual contact involved in the word *contagious*, and the popular opinions which the use of these words foster, that some diseases are infectious and not contagious, whilst others may be contagious though not infectious, imply a far more profound knowledge of the way in which diseases are transmitted than we yet possess. I therefore prefer the wider term infectious, as being more applicable to our present knowledge on the subject.

distances in clothing or running water, and in a variety of ways incompatible with the behaviour of gases. For these reasons, and many others unnecessary to adduce here, it seems clear that the disease must be communicated by the agency of solid, non-volatile particles.

4. The specific disease-producing particles must, moreover, be organized, and possess vitality; they must partake of the nature of *virus* rather than of *poison*.* No poison yet known to chemists can approach, even in a faint degree, the tremendous energy of the active agent of infectious diseases. A poison may be organic, but it is not organized. It may kill with far greater rapidity than the virus of infection, but, unlike this virus, it cannot multiply itself in the animal economy to such an extent as to endow within a few hours every portion of its juices with the power of producing similar results. A virus, on the contrary, renders the liquids of an infected animal as virulent as the original germ. Strychnine may be regarded as the type of a poison, and vaccine matter as the type of a virus.

5. Many considerations tend to show that the virus of cattle plague is a body similar to vaccine lymph, and consists of germinal matter, or living cells, possessing physiological individuality, which, if not exposed to extremes of heat, cold, or dryness, are capable of preserving their activity for a certain time outside the living organism, of adhering to material objects, and of being carried from one place to another by currents of air; each, when introduced into the blood, requires a certain time (known as the period of incubation) during which the septic germs develope and multiply, until they have so far poisoned the blood that the ordinary symptoms of disease become manifest.

The blood poisoning thus set up may legitimately be called "fermentation," it is a decomposition caused by the act of nutrition of the living cell, whereby it reproduces in incalculable numbers the specific septic germs which have given it birth. These gradually infest the blood and other animal liquids, and as the disease progresses are discharged from the skin, throat,

* The words *virus* and *poison* are generally regarded as synonymous. It would be more convenient, and would tend to promote accuracy of thought, were the distinction here made generally adopted.

glands, &c.; the breath, perspiration, and excreta of the animals forming vehicles for the distribution of the virus. By "living" cells is not meant living, in the sense in which an animal, or even a low form of infusoria, lives; but living as a seed, or as vaccine matter, even when dried, may be living, inasmuch as it still possesses reproductive vitality.

6. It is by no means certain that the multiplication of these individual cells is the immediate cause of the blood poisoning. The analogy of the action of virus on the blood to that of yeast on sugar renders it more probable that this is not the fact. In the case of the best known ferment—yeast—its cells multiply by feeding upon the sugar in the liquid; alcohol and carbonic acid being their excretions. It is therefore probable that during the multiplication of the virus cells, they, in a similar manner, impoverish and weaken the blood, by feeding upon some element in it, whilst at the same time they excrete a poison to which the symptoms of the disease may be immediately due.

7. The foregoing view differs from the prevalent notion that the virus of contagion consists of decomposing organic matter, declining from a complex towards a more simple chemical constitution, and during its degradation inducing decomposition in the neighboring particles of matter. This chemical theory at first sight appears very plausible; but it fails to satisfy one necessary condition of the present case. It is possible to imagine that the force set free in the declension of a complex chemical molecule to a more simple form will be sufficient to raise a neighboring molecule to a structure almost as complicated as the original; but according to this view the ferment would be constantly diminishing, whereas in reality it constantly increases in bulk. The hypothesis is therefore insufficient to explain the prodigious procreative power of the original particle. This power belongs only to the nature of an organized germ, capable of producing multiples of itself by a process of nutrition and subdivision. Thus the line of demarcation between organic poison and organized virus appears to be very clearly defined.

This necessarily brief outline of the theoretical views which have governed me in the present investigation will, it is hoped, be clearer and more intelligible after perusing the experimental

proofs which follow. They have been corroborated by numerous small laboratory experiments, as well as by practical operations at different farm-houses.

8. Whether this theory thus briefly sketched be adopted or not, or whether it be regarded as a provisional scientific artifice, it certainly includes and explains a far greater number of the phenomena of pestilence than any other hitherto propounded. Moreover, it is the theory sanctioned by the most influential of those medical philosophers who have the best right to be heard on this subject, and notably by the distinguished Registrar-General, Dr. Farr, who, by the adoption of the word zymotic, in his classification of diseases, has implied his adhesion to this theory.

9. Bearing upon the communicability of this disease are other questions, which hitherto have not received a satisfactory settlement. How does the virus travel? What amount of resistance to ordinary conditions of moisture and time does its vitality confer upon it? Will it propagate and multiply, outside the animal body, under favorable conditions of warmth and moisture? And can we find any chemical disinfectant or antiseptic which will readily destroy it?

The extreme communicability of the pestilence may arise either from the eminently diffusible character of the virus-cells, or from their persistent vitality, or from both conditions combined. It is proved that the *materies morbi* will adhere to clothing, and can be carried a considerable distance in it; that the breath, perspiration, and evacuations of the diseased animal are loaded with virus-cells; and that the secretions from the mouth, nose, and eyes are in a similar condition. It follows, therefore, that the sheds, in which diseased animals have stood, become impregnated with the virus, ready to settle on the clothes of every one who enters; that ponds, streams, and even wells may become contaminated through foul soakage; that a road over which diseased cattle have been driven may be poisoned along its whole distance by the evacuations aud other discharges from the animals; whilst their very breath, carried by the wind, may plant the seeds of infection in all the healthy farms by which the road passes.

There is no difficulty in admitting that the infection may travel for a certain limited distance through the air, and it is even likely that it may be carried longer distances by fogs, or heavy vapors, or by the gases of putrid decomposition; but it appears in the highest degree improbable that the germs should be able to retain their vitality for any length of time in the atmosphere.

10. Sufficient data do not at present exist to decide whether the germs can propagate themselves apart from the animal. Viewing them as of the nature of a ferment, it is not impossible that they may live and multiply in other warm liquids besides the blood; but the most reasonable supposition seems to be that the presence of decaying organic matter, or the gaseous emanations from putrefying dunghills, preserves, or may even revive, the expiring vitality of germs brought by men, dogs, birds, vermin, or perhaps the wind; whilst the same causes which foster the virus cells—dirt, overcrowding, constant re-breathing of their own and the adjacent animals' breath, an insufficient supply of fresh air, the presence of ammonia and other gases of putrefaction, together with inappropriate food—may establish a deteriorated state of body, which causes the animals to fall ready victims at the first approach of the plague.

The existence of these unfavorable conditions may account for the fact that on some farms the disease assumes a character so virulent that no remedy or preservative is of any avail against it, every head of cattle being swept off one after another, each attack being fatal within three days (15, 79, 80.) In the words of a writer in the "Edinburgh Review," "a single spark of infected matter accidentally thrown into the animal economy, thus reduced, as it were, to a touchwood state, fires the mass, which burns until it is consumed."

PART II.—*On Disinfectants generally.*

11. There appears as yet but faint hope of finding a cure for the disease, and even were medical science to supply that great boon, it would be of little use unless supplemented with vigorous disinfecting measures; otherwise it would be like attempting to put out a fire fed on all sides with inflammable materials. Disinfection must, therefore, be the first consideration, and should

be carried as far as possible short of endangering the health of the sound animals by the agents employed. Disinfectants and antiseptics have necessarily a powerful action on vital phenomena; and in some cases it may happen that an animal's vital powers are so diminished by the disease that it will not have strength left to bear the remedial treatment; but even in this case less harm will be done by its use than if the animal had been allowed to die of cattle plague.

12. Disinfection, in the widest sense of the term, includes deodorization, and means the neutrallization or destruction of all substances, arising from putrefying organic matter, or emanating from diseased animals, either injurious to health or offensive to the sense of smell.

The putrefactive products of animal and vegetable matter are found to consist of some or all of the following gases and vapors:—

Sulphuretted hydrogen,
Phosphuretted hydrogen,
Ammonia,
Phosphorus and nitrogen-bases of complex constitution,
Acetic, butyric, valerianic, &c., acids,
Carburetted hydrogen,
Hydrogen.
Carbonic oxide,
Carbonic acid,
Nitrogen,
Various organized animal and vegetable products of little or no activity, and
The special virus of infection. (The latter in an infected district.)

13. In a more restricted sense, the term "disinfectants" is used to express those agents which destroy organic or offensive matter by oxidation or analogous action; whilst under the term "antiseptics" are classed those agents which prevent chemical change by destroying the tendency to putrefy, The latter are termed, by Dr. Angus Smith, colytics, from κωλύω, I arrest.

14. Oxidizing disinfectants are by far the best known and most popular, inasmuch as they appeal directly to popular preju-

dice, by destroying the foul odors which are the usual accompaniments of infection, whilst, antiseptics have little or no action on these gases. I hope to succeed in showing that this fallacious mode of estimating the relative value of disinfectants and antiseptics, is one which does great injustice to the latter.

15. Cleanliness, ventillation, and good drainage have been spoken of as comprising all that is required to preserve cattle from the plague. This is not correct. Due attention to these points will certainly tend to preserve the animals in better health, and will render them more fitted to sustain the exhausting action of the disease; but ventillation, cleanliness, and drainage are unavailing against the importation of the germs of disease from adjacent herds. These measures are of value as they remove what might otherwise become nurseries for infection. A germ from without, falling on to a clean dry stall, is likely soon to die; but if it meet with moisture and dirt, its vitality may be fostered, and the chance of its coming into contact with a healthy animal so much the more increased (10.) Cleanliness, drainage, and ventillation are admirable adjuncts to disinfection, but it is not safe to trust to them alone to ward off the plague. Ventillation, by allowing a greater number of cubic feet of air per minute to pass over the animals, may be, in fact, the means of conveying the infection to them. A moderately ventillated shed, in which antiseptics are freely employed, has been proved to be a place far safer for cattle than an open field; although when the animals have caught the disease the mortality appears to be less when they are turned out into an open field than when they are kept in sheds.

16. Dr. Angus Smith, by his exhaustive examination of disinfectants, has rendered it unnecessary for me to search amongst the numerous classes of possibly useful bodies for those likely to be of practical value. His results I accept in the full conviction that they are correct; and I proceed to investigate the respective merits of the comparatively small number of agents available for disinfection.

17. At the outset it is necessary to strike off at once a whole class of valuable agents which will not meet the requirements of the case. It appears to have been satisfactorily proved that the

infectious matter passes off mainly from the lungs of diseased animals, and that it attacks healthy ones through the same channels. It is suspended in the air with fogs, vapor, and gaseous products of decomposition, settling on rafters and in crevices whence mechanical purification would be unlikely to dislodge it. Partaking in this manner of the physical properties of a vapor, or of fine dust, it is clearly hopeless to attempt to combat the virus by non-volatile solid or liquid disinfectants.

18. For this reason charcoal, chloride of zinc, (Sir William Burnett's disinfecting fluid), solutions of metallic salts, and other similar substances are of very limited use. Moreover, chloride of zinc (and this is probably true of the other metallic chlorides) has been proven to possess no efficacy in destroying specific infective emanations. What is wanted is a volatile and liquid disinfectant, which, after first acting on the excreta, the floors, walls, and stalls of the shed, will, by its quality of gaseous diffusion, rise into the air, enter the lungs of the animals, pervade the whole building, and attack the hidden germs of infection, which otherwise would escape. In addition to this the agent must do its work with as little inconvenience as possible to the cattle and their attendants.—*Lond. Chem. News*, May 25, 1866.

(To be continued.)

RHIGOLENE,*—A PETROLEUM NAPHTHA FOR PRODUCING ANÆSTHESIA BY FREEZING.

[Read before the Boston Society for Medical Improvement, April 9th, 1866,† and communicated for the Boston Medical and Surgical Journal.]

By Henry J. Bigelow, M. D.,
Professor of Surgery in the Massachusetts Medical College.

The above name is proposed as convenient to designate a petroleum naphtha boiling at 70° F., one of the most volatile

* Rhigolene, from ῥιγος, *extreme cold*, to which is added the euphonious termination of most of the other petroleum naphthas.

† About three weeks after my first experiments with rhigolene, I first learned that Prof. Simpson, of Edinburgh, had lately employed "kerosolene" for this purpose.

liquids obtained by the distillation of petroleum, and which has been applied to the production of cold by evaporation. It is a hydrocarbon, wholly destitute of oxygen, and is the lightest of all known liquids, having a specific gravity of 0·625. It has been shown that petroleum, vaporized and carefully condensed at different temperatures, offers a regular series of products which present more material differences than that of their degree of volatility,* and that the present product is probably a combination of some of the known products of petroleum with those volatile and gaseous ones not yet fully examined, and to which this fluid owes its great volatility. A few of these combinations are already known in trade, as benzolene, kerosene, kerosolene, gasolene, &c., all of them naphthas, but varying with different manufacturers. I procured, in 1861, a quantity of kerosolene† of four different densities, and found the lightest of them, the boiling point of which was about 90°, to be an efficient anæsthetic by inhalation.‡ When it was learned here that Mr. Richardson, of London, had produced a useful anæsthesia by freezing through the agency of ether vapor, reducing the temperature to 6° below zero, F., it occurred to me that a very volatile product of petroleum might be more sure to congeal the tissues, besides being far less expensive, than ether. Mr. Merrill having, at my request, manufactured a liquid of which the boiling point was 70° F., it proved that the mercury was easily depressed by this agent to 19° below zero, and that the skin could be with certainty frozen hard in five or ten seconds. A lower temperature might doubtless be

*See Researches on the Volatile Hydrocarbons, with references to authorities, by C. M. Warren. American Journal of Science and Arts, July, September and November, 1865.

†The kerosolene was furnished by Mr. Merrill, Superintendent of the Downer Kerosene Oil Co., South Boston.

‡An account of these experiments may be found in this JOURNAL, July 11, 1861. Reference is made to them in a paper "On the most Volatile Constituents of American Petroleum," by Edmund Ronalds, Ph. D., in the Journal of the Chemical Society, London, February, 1865. Mr. Ronalds there states that "the most volatile liquid obtained by collecting the first runnings from the stills employed in the process of refining petroleum has a specific gravity of 0·666." He had also received a specimen of "kerosolene" from Prof. Simpson, of Edinburgh, at 0·633. It will be observed that the Rhigolene has a specific gravity of 0·625.

produced, were it not for the ice which surrounds the bulb of the thermometer. This result may be approximately effected by the common and familiar "spray producer," the concentric tubes of Mr. Richardson not being absolutely necessary to congeal the tissues with the rhigolene, as in his experiments with common ether. I have for convenience used a glass phial, through the cork of which passes a metal tube for the fluid, the air-tube being outside, and bent at its extremity so as to meet the fluid-tube at right angles, at some distance from the neck of the bottle. Air is not admitted to the bottle, as in Mr. Richardson's apparatus, the vapor of the rhigolene generated by the warmth of the hand applied externally being sufficient to prevent a vacuum and to ensure its free delivery; 15° below zero is easily produced by this apparatus. The bottle, when not in use, should be kept tightly corked, a precaution by no means superfluous, as the liquid readily loses its more volatile parts by evaporation, leaving a denser and consequently less efficient residue. In this, and in several more expensive forms of apparatus in metal, both with and without the concentric tubes, I have found the sizes of 72 and 78 of Stub's steel wire gauge to work well for the air and fluid orifices respectively; and it may be added that metal points reduced to sharp edges are preferable to glass, which, by its non-conducting properties, allows the orifices to become obstructed by frozen aqueous vapor.

Freezing by rhigolene is far more sure than by ether, as suggested by Dr. Richardson, inasmuch as common ether, boiling only at about 96° instead of 70°, often fails to produce an adequate degree of cold. The rhigolene is more convenient and more easily controlled than the freezing mixtures hitherto employed. Being quick in its action, inexpensive and comparatively odorless, it will supersede general or local anæsthesia by ether or chloroform for small operations and in private houses. The opening of felons and other abscesses, the removal of small tumors, small incisions, excisions and evulsions, and perhaps the extraction of teeth, may be thus effected with admirable ease and certainty; and for these purposes surgeons will use it, as also, perhaps, for the relief of neuralgia, chronic rheumatism, &c., and as a styptic, and for the destruction by freezing of erec-

tile and other growths. But for large operations it is obviously less convenient than general anæsthesia, and will never supersede it. Applied to the skin, a first degree of congelation is evanescent; if protracted longer, it is followed by redness and desquamation, which may be possibly averted by the local bleeding of an incision; but if continued or used on a large scale, the dangers of frost-bite and mortification must be imminent.*

It may be superfluous to add that both the liquid and the vapor of rhigolene are highly inflammable.—*Boston Med. Surg. Journ., April* 19, 1866.

WHOLESALE LEAD POISONING.

A Frightful Tragedy in the Walkill Valley.

It is now nearly two months since the people residing along that portion of the Walkill Valley which lies in the western part of Orange County, New York, were attacked by a disease which for some time baffled the skill of the physicians, they being at a loss to divine the cause. The malady, it is true, exhibited the most positive symptoms of lead poisoning, yet all the sufferers stoutly denied having used anything that could, in their estimation, have been contaminated with lead, even in its mineral condition. In some cases, whole families were stricken down, while in others, only one or two members of a family were attacked. Sometimes the disease assumed a violent form, and caused death; and again it was of a milder type, and the patients were relieved. To-day, hundreds are suffering from its effects, many of whom will never be able to do anything, and will in time waste away and die, the victims of this terrible disease.

The symptoms most prominent in these cases have been obstionate constipation, severe pain in the abdomen, nausea and persistent vomiting, colic, difficulty in voiding urine, and, in many instances, the evacuations being mingled with blood, pain and heat in the region of the kidneys, cramps and partial paralysis of the upper extremities, and an anxious, gloomy expression

* The Rhigolene, from the Downer Kerosene Oil Co., may be obtained of Metcalf & Co., 39 Tremont St., Boston.

of countenance. The above are the symptoms which have been present in a greater or less degree of prominence and severity in every case.

Professional men at once saw that these symptoms pointed to, and were characteristic of, lead poison; but it was also observed that some or all of them were encountered in other and far different forms of disease, as in *colica enteritis*, (inflammation of the intestines,) *hæmaturia*, (bloody urine,) *dysuria*, (difficulty in voiding urine,) and other conditions of the system, in which spasm, nervous disorder and paralysis manifest themselves. The only diagnostic symptom which, regarded by itself, was conclusive as to the lead poison, was the blue line at the margin of the teeth, which has been present in almost every case. The doctors were sorely perplexed, but, in about two weeks after the first violent cases came under their notice, they had, by careful study, traced the lead in the system, so that there was no longer any doubt on *that* point. It now remained to ascertain the source from whence it came.

After considerable research, it was found that the lead was conveyed into the stomachs of the sufferers by bread and meal; and, as a greater part of those staples were manufactured at the mill of a Mr. Marsh at Phillipsburg, an investigation was at once made in that direction, and the following facts were elicited, greatly to the surprise of every one, the miller himself included:—

It appears that Mr. Marsh had gained an enviable notoriety for the superior quality of his flour, and that the farmers, for many miles around, were in the habit of bringing their wheat and corn to his mill to be made into flour and meal. Aside from this, he exported largely, so that his mill, which has four run of stone, was kept constantly going—by night as well as by day. One set of these stones was set apart for his "custom" work. This was an old set, constantly needing repairs, and large cavities frequently manifested themselves, which, instead of being filled up with the cement generally used for that purpose, were filled with common lead. Some of these holes were as large as a hen's egg, one, we are informed, being as large as the palm of a man's hand. If, when filled, the lead projected above

the surface of the stone, it was hammered down level. They were then adjusted, the grain was run in, and the motion began and was gradually increased, until a very high rate of speed was attained. Of course, the attrition caused by this velocity detached particles of lead from the stone, and mingled them almost imperceptibly with the flour. Each moment increased the amount, so that to every pound of flour there was enough lead imparted to make small buckshot. With the enormous business of Mr. Marsh, the reader can imagine how much lead was being distributed throughout the surrounding country, to be absorbed into the systems of those who partook of the flour.

The lead in this form was comparatively harmless, but when fermented and subjected to the baking process, it was immediately transformed into carbonate of lead—the deadliest of all lead poisons. Bread of this kind was but little better than bread spread with white lead as a substitute for butter.

Were it not for the fact that the lead was taken in such large quantities as to produce a counter state of action, hundreds would have died before the cause could be discovered.

As soon as it became apparent that the disease sprang from the bread of which the sufferers had partaken, Dr. Darrance and Mr. King, a very skilful chemist of Middleton, at once determined to analyze the flour. Samples were procured, and to their astonishment they found that the lead could be discerned with the naked eye. Next, a microscope revealed it beyond a doubt, and, as a still further proof, it was subjected to some six standard tests, each one showing the presence of lead in large quantities. After these tests, all the flour which had come from Marsh's mill, was immediately returned to him, and the mill ceased running; but the mischief was already done, the seed had been sown, and the fruit was coming forth at an alarming rate; the young and old were stricken down, those who were afflicted with any chronic disease being the greatest sufferers. Of course, a panic was the result, and the doctors were kept busy day and night. I do not care to pain your readers with a recital of the terrible agonies endured by these unfortunate people, but the scene throughout a radius of from 20 to 30 miles of the country were truly heart-rending. Only

those who have suffered can form any idea of the horrors, the inward fires which were consuming the patients, or the agonizing cramps that contracted every muscle of their weakened frames.

Fortunately, the bakers of the place had purchased their flour from the Western States, or the disease would have spread to a much greater extent. Many of the grocers, as well as private families, were in the habit of receiving their supplies regularly from the mill, and, of course, all who used them were afflicted.

To-day, I have visited most of the leading physicians here, and append a tabular statement of the number of cases treated by each from the middle of March to the present time:—

Dr. Darrance	40	Dr. Smiley, about . . .	30
Dr. Everett	51	Dr. Wright, about . . .	45
Dr. Johnson	38		
Dr. Bradner (severe) . .	9	Total	213

This only includes the region in the immediate vicinity of Middleton, and does not embrace Goshen and its environs; but I am informed that there have been over 100 cases in that neighborhood. One of the sad cases here is that of Col. Wickham, Justice of the Peace, and his wife. He will probably never recover fully from the effects, and Mrs. Wickam, who has for a long time been in delicate health, is wasting away to the grave under the influence of this frightful poison. A well-known employé of the Erie Railroad Company has died from its effects. A child of Dr. Johnson has also died. This case was a very peculiar one. It appears that the child had been fed upon the milk of a new milch cow, which usually gave 14 quarts of milk daily. About two months ago, the child was affected strangely, but at the time nothing was thought of its symptoms. About this time, the milk began to fail, and no cause could be assigned. Dr. Johnson partook freely of gruel made from the milk of this cow and meal prepared at Marsh's mill. After taking it, he vomited copiously, but did not charge it to the gruel. The child being fond of the gruel, it was given to her, and, after eating it, she was seized with convulsions at intervals, and, despite all the medical skill employed, died. The meal was lead-poisoned, and so was the milk, for the cow was fed upon feed ground at Marsh's

mill. The cow, having failed in milk, was sold and has been lost trace of.

I could fill two pages of your paper with facts which I have obtained here to-day in relation to this peculiar case of wholesale poisoning. I am informed that a large quantity of the poisoned flour has been sent to New York city to be made into starch. *If* it has been made into that article, we are safe; but if speculators have placed it in the market for sale, we shall soon see the effects. At any rate, it is the duty of the Board of Health to take some steps to ascertain if that flour is in the market *now*. There are seven cases of poisoning by this flour in New York city to-day.

Early in the morning, I leave for the mill to see the miller and obtain additional facts in relation to this sad affair. Scores of men, who, a few weeks ago, were in the full enjoyment of health and strength, are ruined for life, and totter to and fro, their faces having the appearance of dry parchment, their eyes sunken and encircled by a dark ring; their lips blue, their muscles contracted and their limbs distorted; for them to move is intense pain; relapse follows relapse, till, in time, they succumb to the effects of this fearful malady.—*N. Y. Tribune, June 1st.*

There is no question but that Mr. Marsh was entirely ignorant of the poisonous properties of lead, and supposed that because lead in its metallic form did not always cause injury, that it would not do so in any other form. He was not aware that lead, after being subjected to the process of fermentation and baking, was transformed by chemical action into carbonate of lead—a deadly poison. All may be thankful that the lead was taken into the system in such large quantities, for it was that which brought on the vomitings, and threw off very much of the poison before it had sufficient time to act with its full and fatal effect.

Having had a long interview with Mr. Marsh, our reporter drove to Goshen, where in the short time allotted to him before the starting of the train, he conversed with several persons who were acquainted with the facts stated, and all add their weight of testimony to that already furnished, showing conclusively that over 300 persons in a radius of about 20 miles have been

affected with lead-poisoned flour which came from the Philipsburg mill. This should be a warning to millers, and a caution to the buyers and consumers of flour, and physicians and Boards of Health should examine all the flour-mills of the country, and, by so doing, prevent the recurrence of such cases as we have recorded in our letters.—*N. Y. Tribune, June* 2.

MAGIC PHOTOGRAPHY.

Such is the designation of the latest novelty in our art-science —a designation which we borrow from a sensational advertisement in one of the daily papers. Its nature may thus be stated: Two sheets of paper are supplied to the purchaser, together with instructions. One of these sheets is albumenized, the other is a sheet of blotting-paper. There is no picture visible on the albumenized paper; but when, in accordance with the instructions given, the sheet of blotting-paper is moistened by means of a few drops of water and pressed in contact with the face of the albumenized paper, a picture immediately springs into existence. The question now arises: How is this accomplished? Light has evidently nothing to do with it, seeing that the same phenomenon occurs both in sunshine and in comparative darkness.

The following is the method by which these "magic photographs" are produced: Print a picture on albumenized paper in the usual way, taking care not to print so deeply as ordinarily. Fix the print (without toning) in plain hyposulphite of soda, wash thoroughly, and then immerse it in a saturated solution of bichloride of mercury till the image disappears. Again wash thoroughly and dry. The paper now appears like a piece of plain albumenized paper, without any appearance of a picture on it, and in this condition it may be kept for an indefinite time.

To cause the image to appear instantaneously and in more than its pristine vigor, dip the paper in a weak solution of hyposulphite of soda; or, preferably, dip a piece of white blotting-paper in a solution of hyposulphite of soda and dry it. This prepared paper may be kept in contact with the latent picture so long as moisture is excluded. When it is required to develop the image, moisten the blotting-paper with common water and press it

against the albumenized surface of the print, when, presto! the "magic photograph" is produced, and is, when washed, as permanent as many of the photographs of the present day. The image, by being again immersed in the bichloride of mercury solution, may be once more rendered invisible, and, by the hyposulphite solution, again restored as often as may be desired.

Although we believe that this process of magic photography has been patented a few weeks since, every intelligent photographer who has made himself acquainted with the past history of our art-science, knows that many years have elapsed since this "magic" process was first practised.

The amusement that can thus be introduced into the social circle by the "magic photographs" may be easily conceived.—*Journal Franklin Institute, June*, 1866, from *London British Journal of Photography, No.* 312.

LINOLEUM MANUFACTURE.

The manufacture of this new and interesting material, which threatens to rival the india-rubber trade in the multiplicity and utility of its applications, is based on the invention of Mr. Frederick Walton, whose patents are now worked by the Linoleum Manufacturing Company, at Staines, and 45 Cannon Street, West. The word linoleum is derived from *linus* (linseed), and *oleum* (oil), from which products the new substance is made. The linseed oil of commerce is solidified or "oxydized" by the absorption of oxygen, by which process it becomes changed into a semi-resinous substance. It is then combined at a strong heat with resinous gums and other ingredients, and the substance thus obtained has all the appearance and many of the properties of india-rubber.

"Those who are conversant with the uses of the pliable elastic gums readily perceive the wide field of usefulness that any materials possessing such properties is designed to occupy, more especially as the price of the new substance is much lower than india-rubber or gutta-percha. Linoleum can also be dissolved into a varnish or cement in the same manner as india-rubber, and in this form can be employed in the manufacture of material for

water-proof clothing. As a varnish or paint for protecting iron or wood, or for coating ship's bottoms, it is said to be admirably adapted, as it dries rapidly, in fifteen or twenty minutes, and adheres with singular tenacity. As a cement for uniting substances, such as wood with iron, or wood with wood, it is very effective, and has similar properties to the marine glue made from india-rubber and shellac. Singularly enough, linoleum can also be vulcanized or hardened by exposure to heat. By this means it is made as hard as the hardest woods, and rendered capable of receiving a high polish without the aid of varnish or any other extraneous substance. In this condition it can be filed, planed, or turned as easily as wood, and employed in many of the various ways for which wood is used. Or it can be moulded in heated dies to any desired form, as for example, flax-spinners' bosses, sheaves for ships' blocks, surgical instrument handles, picture frames, mouldings, veneers to imitate marble, ivory, ebony and other woods. Combined with emery, it forms a grinding-wheel having extraordinary cutting or abrasive power. Very dissimilar are some of the uses to which the new substance can be applied. Carriage-aprons, cart-sheeting, sail-covers, reticules, tarpauling, printers' blankets, gas-pipes, telegraph supports, washable felt carpets, table covers, paints for carriages or for printing floor-cloth, or enamels of any color for enameling papier-mache or metals. These are only some of the many uses to which linoleum may be applied.

"The manufacture has, however, hitherto been chiefly confined to the development of the floor-cloth trade, for which the new material has proved itself well adapted. Linoleum floor-cloth is produced by combining the linoleum with ground or powdered cork, which is rolled on to a stout canvas, the back of the canvas being afterward water-proofed with a cement or varnish made from the solidified or oxydized oil before referred to. The combined fabric so manufactured is then printed by means of blocks in every variety of pattern, in the ordinary way. The floor-cloth thus produced is pliable, and comparatively noiseless to walk upon. It washes well, preserves its color, and can be rolled up like any ordinary carpet. Besides being very durable—the component parts being almost indestructible except by fire—it will

not decompose by heat or exposure to the sun or air, as is the case with india-rubber. It is therefore better adapted than that substance for hot climates. To the chemist, engineer, and manufacturer, linoleum offers quite a new substance for experiment, and no doubt, as it becomes better known, the various uses to which it may be applied will be more fully developed and appreciated. The patentees, we understand, are prepared to grant licenses for the manufacture of some of its applications, such as varnishes, cements, and the hard compounds above mentioned. Important results may therefore follow the introduction of this new and valuable substance."—*Druggists' Circular, June,* 1866, from *Mechanics' Magazine.*

ACTIVE PRINCIPLE OF SENNA.

Prof. Dragendorff and Mr. Kubly, of Dorpat, have succeeded in separating from senna leaves the true active purgative principle, an acid to which they have applied the name of cathartic acid, formerly employed for an impure substance to which the active properties were ascribed. This acid principle is insoluble in water, strong alcohol, and ether, but enters into the watery infusion combined with alkaline and earthy bases. Acids, with the exception of tannin, precipitate it from its solutions in dilute alcohol. The principle is obtained in an impure form by treating the syrupy extract, obtained *in vacuo* from a strong watery infusion, with renewed portions of absolute alcohol, rejecting the first precipitate, but collecting the subsequent ones, which are then purified by repeated solution in water and reprecipitation by means of absolute alcohol. It is finally purified by dialysing it with moderately strong muriatic acid on parchment paper, cathartic acid possessing strongly colloidal properties. It contains both nitrogen and sulphur, and is a glucoside, since treatment with acids in the heat, caused splitting into another (cathartogenic) acid and sugar. Alkalies, in the heat, likewise act destructively.

The ammonia salt of cathartic acid gives a brownish, flocculent precipitate with salts of silver, and a similar one with protochloride of tin and chloride of mercury; sulphate of copper and ace-

tate of lead likewise produce precipitates; tartrate of antimony, tannin, yellow and red prussiate, none. The minimum dose of the pure acid was found to be about one and a half grains, which causes several stools, with decided griping.—*Druggists' Circular, June*, 1866.

Varieties.

On the adulteration of Resin of Jalap with Aloes.—M. Daenen (Bull. Soc. Pharm. Brux.) calls attention to a specimen of resin of jalap, which he was led to suspect, by its bitterness, not to be pure. It was friable, and gave a yellowish gray powder: nearly insoluble in ether, sulphuret of carbon or chloroform; entirely soluble in alcohol of 28° Baumé, and partially soluble (30 per cent.) in distilled water, liquid ammonia, and an aqueous solution of carbonate of soda, when pure resin of jalap is insoluble in these three last menstrua. It also afforded carbozotic acid by the action of nitric acid, and was not affected by chlorinated soda solution in a manner to indicate guaiac.

Syrup of Copaiba and Syrup of Cubebs in diphtheria and croup, as used by M. Trideau.—The following is the recipe for the syrup:

Take of Copaiba, two troy ounces and a half.
Gum Arabic, in powder, five drachms.
Water, twelve and a half drachms.
Essence of Peppermint, sixteen drops.
Syrup of Sugar, twelve and a half troy ounces.

Emulsionize the copaiba with the water and gum, then add the essence, and lastly the syrup, and mix. For adults half a table-spoonful of the syrup of copaiba every two hours; besides a table-spoonful of simple syrup used as the vehicle for 15 grains of powdered cubebs recently powdered, given also every two hours in the intervals of the dosing with copaiba.

In serious cases the doses of cubebs may be carried to six drachms in twenty-four hours, and for children three drachms.

It sometimes happens, after twenty-four hours' use, the copaiba will not be tolerated by the stomach; when it should be temporarily suspended. Two or three drops of laudanum in every ounce of syrup corrects this difficulty to a great extent. This medication was employed by Dr. Trideau in the prevalence of a serious epidemic in the department of Mayenne, with great success.—*Repertoire de Pharmacie, Mars*, 1866, *p.* 357.

Syrup of Pepsin with Bitter Orange Peel of M. Besson.—Take the aqueous infusion or soluble portion of fifty veal rennets, and evaporate in vacuo until the residual liquid weighs 74 troy ounces. To this add of lactic acid 170 grains, spirit of oranges three ounces, hydro-alcoholic extract of Curaçao (bitter orange peel,) three ounces and a quarter; filter through paper, and then dissolve in the liquid 144 troy ounces of sugar. Strain through muslin, and bottle.

An ounce of this syrup contains 2¼ grains of acidified pepsin, that is to say, as much as three doses of fifteen grains each of the amylaceous pepsin of Boudault and Corvisart. Finally, it has an advantage over the powder of retaining during many months, or even years, its fermentable properties.—*Jour. de Chimie Medical* et *de Rep. de Pharm.*

On Vanillin. By M. Stokkeby (Zeitschr. Chem., 1865, 467).—The results of this experimenter confirm in general those published by M. Gobley (see page 130, vol. xxxi. of this Journal,) on *vanillin*. The principle which gives the character of *frost* is exempt from nitrogen, is slightly acid, but does not decompose the carbonates. M. Gobley called it *vanillin*, but M. Stokkeby *vanillic acid*.

The analytical results of the latter differ from those of the former, whilst the properties are sufficiently similar to establish their probable identity.

According to Gobley, its formula is $C_{20}H_6O_4$, whilst that of Stokkeby is $C_{34}H_{22}O_{20}$, the analyses being made with the substance dried at 140° F.

According to the latter author, vanillin dissolves in an equal weight of boiling alcohol or ether, but at 59° F. one part of vanillin dissolves in 6⅓ parts of ether, sp. gr. ·730, and in 5⅔ parts of alcohol ·823. It is soluble in 11 parts of boiling water and in 198 parts at 59° F. Sesquichloride of iron communicates to all its solutions a deep violet color. Its fusing point appears fixed at 180° F. Sulphuric acid dissolves it with a green color, which becomes red by heat. Nitric acid transforms it into oxalic acid.

Vanillin is volatilizable with the vapor of water. When the distilled water is shaken with ether, and the ether separated and evaporated, crystals of vanillin are obtained.

The author also investigated the other constituents of vanilla. It yields to ether resin, wax, fixed oil and a form of tannin, greening the salts of iron. The residue contains some vanillin, gum and saccharine matter, phosphates and sulphates, but neither albumen or starch.—From *Jour. de Pharm., Janv.*, 1866.

Two new Alkaloids in Aconitum lycotonum.—M. Hubschmann has extracted two alkaloids, which he calls *acolytin* and *lycoctonin*, from this plant. The first is a white powder, insoluble in ether, but soluble in water and alcohol. The lycotonin is crystallizable, very soluble in alcohol, and dissolves but little in ether and water.

Method for assaying the purity of Arrow Root from the Maranta.—M. Albers (*Archiv. der Pharm.* and *Dingler's Polytech. Jour.*,) gives the following method for discovering the presence of wheat or potato starch in the arrow-root of the Maranta. The following is the process:

Take one part of fecula, and mix it with three parts of a proof liquor, consisting of two parts of chlorohydric acid, sp. gr. 1·120, and one part of water, at the ordinary temperature. In three or four minutes pure arrow-root will not be affected by the acid liquor, but wheat or potato starch, on the contrary, will be changed to a transparent gelatinous mass, which becomes fluid by the further action of the acid, transforming the starch jelly to dextrine. When potato starch is the adulterant, it evolves a peculiar odor, well known to those who have made dextrine from it. When a mixture thus exists, the true arrow-root granules will subside as the gelatinized adulterant is converted to dextrine, and may be separated by a strainer, washed, dried and weighed, and the relative amount of adulteration may be judged of approximately by the consistence of the jelly as at first developed.—*Jour. de Pharm.*, 218 *Fevrier*, 1866.

Urea a normal constituent of Cows' Milk.—M. Lefort announces (*Jour. de Pharm.*, March, 1866, p. 177,) the existence of urea in the milk of healthy cows. From 10 litres (2½ gallons) of this milk he obtained 23 grains of nitrate of urea, easily characterized by its crystals and by its combination with binoxide of mercury.

Alloys of Manganese.—In Germany M. E. Prieger has commercially prepared alloys of manganese with iron or copper possessing valuable properties, and the application of which are constantly improving in number and utility. To prepare the alloys of iron and manganese (ferro manganese), he made a mixture of pulverized oxide of manganese, charcoal dust (corresponding in quantity to the oxygen of the oxide) and of metallic iron sufficiently broken up, such as minute grains of cast-iron filings or turnings of iron or steel, &c.; the mixture was put into a graphite crucible, which would hold from 15 to 25 kilogr., and covered with a coating of charcoal dust, sea salt, &c., then heated for a few hours at a white heat. After cooling there was at the bottom of the crucible a metallic homogenous mass, containing but very insignificant quantities of foreign bodies. Of these alloys the most important are those containing 2 equivalents of manganese to 1 of iron, and 4 equivalents of manganese to 1 of iron, and corresponding to 66·3 per cent., and 79·7 per cent. of manganese. Both are harder than tempered steel; they are capable of receiving a very high polish, they melt at red heat, and can be easily poured; they do not oxidize in the air, and even in water only superficially; their white color is of a shade between steel and silver. Alloys of copper and manganese are similarly obtained; they resemble bronze, but are much harder and more durable. Alloys of tin are very fusible, durable, and easy to work; in

color and brilliancy they may be compared to silver. The iron and manganese alloy furnishes a very simple means of adding to iron or steel a given amount of manganese; by the addition of from 1·10 to 5 per cent. very satisfactory results are obtained.—*London Chem. News, Jan.* 5, 1866.—*Deutsche Industrio-Zeitung*, clxxxv., 184.

Mining Statistics of Great Britain for 1864.—

	Produce of mines.
Coal,	92,787,873 tons.
Iron ore,	10.064,890 "
Pig iron,	4,767,951 "
Copper ore,	214,604 "
Metallic copper,	13.302 "
Lead ore,	94,433 "
Metallic lead,	91,283 "
Silver (from lead ore),	641,088 ounces.
Zinc ores (nearly all sulphuret),	15,407 tons.
Metallic zinc,	4,040 "
Iron pyrites (for sulphuric acid and soda works),	94,458 "
Tin ore,	15,211 "
Metallic tin,	10,108 "
Gold (from Merionethshire),	2,887 ounces.

The gross value of the above mineral products was £39,979,837. There were 2,351,342 tons of coal taken to London in 1864 and 1,786,713 tons in 1863. Eight and a half millions of tons of coal were exported in 1864, and nearly half a million of tons of iron.—*Athen., Aug.* 19.—*Silliman's Journal, November*, 1865.

American Pharmaceutical Association.

The fourteenth Annual Meeting of the American Pharmaceutical Association will be held in Detroit, Michigan, on Wednesday, August 22d, at 3 o'clock, P. M. The objects of the Association are now so well known, that it is believed a simple notice is all that is needed to insure a full attendance of its members. In order to facilitate the business of the meeting, it is hoped that all members of Committees having reports to make, or any members desiring to offer any papers, will be prepared to present them at an early period of the meeting. Those unable to attend, are requested to send them in season to the care of Frederick Stearns, Esq., Detroit, Michigan.

HENRY W. LINCOLN,
President A. P. A.

Boston, June 11th, 1866.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The time for the convening of this body is rapidly approaching, as the adjournment was to Wednesday, the 22d day of August, 1866, at Detroit, Michigan. By a letter just received from Mr. Stearns, we are informed that the meeting will convene in the Supreme Court Room, and occupy it during the sessions. It is central and convenient. The hotel recommended is the Russell House, also central. The location is unusual, but readily accessible, both from east and west, and offers much of interest to the traveller from its proximity to the great lakes. For eastern members a visit to Niagara will of course be included, and to those whose leisure and means admit, the Lake Erie, St. Lawrence and Champlain route of return may be adopted. Others may be induced to proceed yet further north-west and north, and visit the interesting region of Lake Superior, or make the round trip to Chicago by steamer. For the information of such, we are able to state that the large steamer Ironsides will leave Detroit at 2 P. M. on August 24th, bound to Superior City, via Lake St. Clair, Lake Huron, Soult St. Marie, Marquette, Eagle Harbor, Ontonagon, &c., and make the trip there and back in about ten days, and at a cost of about $45. Those who prefer it can leave the steamer at Marquette, on their return, and proceed to Chicago by rail.

Of the meeting itself we hope much; many valuable answers to queries will no doubt be presented, and several important reports be read. Our St. Louis friends, on whom mainly the Report on the Progress of Pharmacy devolves, have doubtless been active in its preparation; and the Committee on the drug-market have had a fair opportunity, in the abundant importations during the past year, to determine the various points of interest to the Association which their duty involves. Much should be expected of this committee, as the members are well qualified for the task, and well located for carrying it out. Those members who have accepted queries will aid the Association, and help on its usefulness by promptly meeting their engagements, and avoid this year a repetition of the distasteful task of recording negatives, and presenting an attenuated volume of proceedings. Last year the meeting at Boston was one of the most interesting we have had to those who attended, but far less so to the absent, from the sparsity of papers. Let all make an effort to go, or if that be impossible, to send a contribution.

PROF. JOHN M. MAISCH.—The vacancy in the Philadelphia College of Pharmacy, occasioned by the resignation of the Professorship of Pharmacy, by Prof. Procter, has been filled by the Board of Trustees by the election of Mr. John M. Maisch, late of the New York College of Pharmacy, and of the U. S. Army Laboratory. We know of no one who can bring to the

task involved in this appointment so large a share of practical and theoretical knowledge as Prof. Maisch, and we doubt not he will give his efforts to the promotion of the school, and the advancement of the important branch he has been chosen to illustrate. He has our hearty good wishes for a successful and useful career.

THE METRICAL SYSTEM OF WEIGHTS AND MEASURES.—During the present session of the Congress of the United States that body has *authorized* the use of decimal weights and measures in commercial transactions, but the enactment is only permissive, not compulsory, and intended as a means of familiarizing the people with the system, so far as individual efforts may carry its introduction into use. Their harmony with our monetary system will greatly aid the understanding and adoption of metrical weights and measures; and as it is the best system yet practically introduced that is suitable for universal adoption, efforts in England and other countries have been made to get it recognized as the universal standard for the commerce of the world. This is neither the time or place to discuss metrical subjects, else we might be tempted to offer some views on the subject, yet it will be well to suggest it as a suitable subject for discussion at the next meeting of the Association, as to how far the members are prepared to urge the claims of the Decimal system on the revisors of the Pharmacopœia of 1870.

The action of Congress was probably accelerated by the report of the Committee of the National Academy of Sciences on "uniform weights, measures, and coinage," in January last, which was ordered to be communicated to the Congressional Committee and the Treasury Department. The Committee favor the ultimate adoption of a decimal system, and believe the French metrical system has fewer faults than any other yet in use. They recommend that metrical standards of weights and measures be prepared by law and distributed to the States and Custom Houses. They also suggest that the weight of a single letter be fixed at 15 grammes instead of 14·17 grammes, (half an ounce), as at present, and to make one and two-cent pieces weigh respectively 5 and 10 grammes, with diameters in a simple ratio to the metrical unit of length.

THE NOTTINGHAM MEETING OF THE BRITISH PHARMACEUTICAL CONFERENCE.—This body will meet on Tuesday, the 21st of August, at Nottingham, and it is proposed to hold an exhibition of objects relating to Pharmacy, or having a special interest for members of the drug trade. We have received from Mr. Reynolds, of Leeds, too late for insertion, a circular, signed by the general and local Secretaries of the Conference, Dr. Attfield, R. Reynolds, and J. H. Atherton. The objects considered appropriate are chemical and philosophical apparatus, pharmaceutical apparatus and appliances of all kinds, labels, new medicines, simple or compound, and new methods or forms of administering medicines, specimens of drugs or chemicals of fine quality, and botanical speci-

mens illustrating the Materia Medica. Foreign preparations, officinal or proprietary, adulterations, dietetic articles, Pharmaceutical books, Historical relics, connected with Pharmacy, portraits, photographs, autographs, &c. The exhibition is to be open from August 21st to the 25th, inclusive. The English people are famous for exhibitions, and we doubt not that this will be an important feature connected with the conference, of the business of which, however, it is not strictly a part.

International Pharmaceutical Congress of Paris, 1867.—In January last, M. Robinet stated to the Society of Pharmacy, that a majority of his colleagues, at the Congress of Brunswick, approved of Paris as the place of the next meeting of this triennial body. A Committee was appointed, and in February, the Society, by its vote, accepted the mission of taking all the necessary measures to arrange for the meeting in Paris in 1867. At the meeting in March, the following programme was adopted:

1. There will be held in Paris, in 1867, an international Congress of the Associations and Societies of Pharmaceutists of all countries.

2. The Congress will consist of delegates from regularly constituted Societies of Pharmacy. It will have for its object the discussion of scientific and professional questions interesting practical pharmacy, and the study of the means best adapted to promote the mission and duties of pharmaceutists.

3. Each Association may send three members, but these represent but one vote, but all three of the delegates may take part in the discussions. Societies or Associations, including the pharmaceutisis of an entire State, may appoint three delegates for every one hundred members in the Association.

4. Delegates to a Pharmaceutical Congress are not delegates by right to the following Congress.

5. Delegates should come possessed of written credentials from the Society they represent.

6. At the first session, the President of the Committee of Organization will proceed by ballot to nominate the officers, who will consist of a President, five Vice-Presidents, a Secretary, and three Assistant Secretaries.

7. The officers will be charged with the publication of the minutes.

8. The several questions submitted to the Congress will be submitted to special Committees for examination and report.

9. Discussions will in general be conducted in French. To facilitate the deliberations, capable interpreters will be provided by the Commission of Organization.

10. No paper on questions not in the order of the day can be read without permission of the officers.

11. Decisions will be taken by the majority of votes.

12. A Committee of Organization appointed by the Society of Pharmacy

of Paris, and composed of titular members of this Society, will be charged with all the preparatory measures for the meeting of the Congress. They will receive the views, propositions and communications of all pharmaceutists who may desire to address them.

13. The Committee will prepare, under the direction of the Society of Pharmacy of Paris, the programme of the session of the Congress of 1867, and will publish it in good time in the greatest number possible of Journals of Pharmacy of all countries.

14. Before the close of the second session, the Congress will nominate a Committee to prepare for the third Congress.

15. Associations having the intention of being represented at this Congress are desired to send, as early as possible, the names and addresses of their delegates.

16. The Commissioner General is charged with all the correspondence appertaining to the session of 1867, at Paris. The following members of the Society of Pharmacy at Paris were elected at the meeting in April as the Committee of Organization, viz.: MM. Robinet, Guibourt, Buignet, Boudet, Gobley, Lefort, and Mialhe.

American Sanitary Museum at Paris.—Mr. Abner L Ely, of New York, has sent us a printed circular from Dr. Thos. W. Evans, of Paris, who has taken much interest in the labors of the "Sanitary Commission" as regards mitigating the horrors of war, during the operations of the Army in the late rebellion, and now desires to acquaint the European public with the great number of ingenious inventions made by his countrymen in view of relieving the sick and the wounded soldiers. We extract the following:—

"In order to realize this project, I intend to assemble in a collection the products of those inventions which have enabled the Sanitary Commission to fulfil its mission.

"The universal Exhibition that is to be opened in Paris in 1857, is certainly the best opportunity for the inauguration of this Sanitary Museum. During that exhibition no civilized nation will be unrepresented in the French metropolis. The articles exhibited in such a museum will therefore call the attention of all those who wish the welfare of mankind and acquaint all nations with the name of their inventors.

"In addressing myself to my countrymen I am firmly convinced that they will assist me in this patriotic and humanitary enterprise. Although I am willing to purchase all such articles as may be useful, I shall gratefully accept any objects that the inventors or manufacturers would wish to contribute.

"I therefore most respectfully request all such persons who are disposed to co-operate in the creation of the American Sanitary Museum, to address their communications to Dr. Thomas W. Evans, 15 Rue de la Paix, Paris, France, or to Mr. Abner L. Ely, 22 Pine St., New York."

NEW YORK COLLEGE OF PHARMACY.—At the annual meeting of this Institution, held March 15th, 1866, the following members were elected to office:

President, John Milhau; *Vice Presidents*, Geo. C. Close, Wm. Neergaard, Isaac Coddington; *Secretary*, P. W. Bedford; *Treasurer*, Thos. T. Green; *Trustees*, Geo. D. Coggeshall, John Frey, Theobald Frohwein, Arthur W. Gabaudan, Gustavus Krehbeil, Ferdinand F. Mayer, B. H. Reinold, John W. Shedden, Wm. Wright, Jr.

The following gentlemen were declared Graduates in Pharmacy, and awarded their Diplomas, viz.: Jas. G. Beach, Herman Krehbiel, Charles O. Rano, Lucien M. Rice, Eugene J. Weeks.

BRAHEE SUGAR.—A correspondent in North Carolina, being desirous of testing the merits of this substance, has written to us about it; but all we can learn through the Pharmaceutical Journal is that under this name a patent medicine or nostrum, put up in papers as powders, under the name "Brahee Sugar," professes to be a great remedy for rheumatism. The Editor saw the powders, which had the appearance and taste of sugar of milk, but the agent declined giving any information regarding its origin or composition. From its tastelessness it is not improbably a mixture of hydrochlorate of propylamina and milk sugar; a point to be easily ascertained, however, by the elimination of the fishy odor of propylamin on adding liquor potassa. This is a mere supposition and suggestion, however.

A HARD CASE—Polish physicians and apothecaries, according to a circular from General Bezak, published Dec. 21st, in the "Invalid Russe," are commanded not to use their native language in their accounts, that their books must be kept in the Russian language, and that the labels placed upon their vials and boxes must exclusively be made out in that language, (which it is presumed the peasantry don't understand,) under a penalty of 50 roubles for the first violation of the order, 100 roubles for the second, and complete suppression of business for the third. Physicians are to be warned that they must not write their prescriptions in any other language than Russian or Latin, under a penalty of ten roubles for each prescription in Polish; and physicians in the service of the State will in addition be deprived of their appointments. These facts, which we derive from the Pharmaceutical Journal, exhibit an intensity of Imperial hate that would wipe out the very language of a conquered and oppressed people even though it be used as a medium of medical aid to the sick and dying.

RECEIVED:—

Food and Digestion. Read before the Albany Institute, Feb. 27, 1865, by Howard Townsend, M. D., Prof. of Physiology and Materia Medica in Albany Medical College. Albany, 1866; J. Mansell. pp. 18. From the author.

Twenty-third Annual Report of the Managers of the State Lunatic Asylum, for 1865. Albany, New York, 1866, pp. 49.

Burgoyne, Burbridge and Squire's Monthly Price Current; 16 Coleman St., London. May 1st, 1866, pp. 16. Folio.

Concentrated Extract of Beef, of Tourtelot Brothers, Chicago, Ill., prepared in vacuo at a temperature of 120° F.; put up in small tin cans. This "Extract" is soft and moist and claims to yield the "Beef-tea" more readily than the solid extract. We have not yet had an opportunity to test it.

OBITUARIES.

William Thomas Brande, Esq., D. C. L., F. R. S.—The able and well known chemist, who died on the 18th inst., at Tunbridge Wells, was the scion of a Hanoverian family which settled in England, *temp.* George II., his grandfather and father being both Royal Physicians here. He was born in 1786, and was educated at Westminster School. After a subsequent sojourn in Hanover, he returned to England, and became a student of St. George's Hospital, attending in 1805 and 1806 the lectures of Dr. George Pearson on Chemistry, &c., and afterwards those of Frederick Accum. Subsequently he became assistant to Sir Humphry Davy, at the Royal Institution. He, in 1808, gave satisfaction as a lecturer on chemistry at Dr. Hooper's, in Cork Street, and then joined, as teacher and demonstrator of chemistry, the Medical school in Windmill Street. In 1809 he was made a F.R.S., he received the Copley Medal in 1813, and was made Senior Secretary of the Royal Society. In 1812 he was appointed Professor of Chemistry and Materia Medica to the Apothecaries' Company, and in 1851, was elected Master of the Company. He was, in 1813, made Professor of Chemistry at the Royal Institution, and delivered lectures for many years, with great success and popularity, in conjunction with Mr. Faraday, who was also associated with him as editor, for a long period, of the *Quarterly Journal of Science.* He was, in 1825, made superintendent of the coining department of the Mint. About 1837 he was associated with Mr. Griffiths in chemical lectures at St. Bartholomew's Hospital. He was also a fellow and examiner of the London University. He was the author of a standard "Manual of Chemistry," which has been translated into many foreign languages. He was also author of "Outlines of Geology" and a "Dictionary of Pharmacy," and was editor of a "Dictionary of Science, Literature and Art." He, in 1853, received the honorary degree of D.C.L. from the University of Oxford.

William Southall, one of the oldest members of the Pharmaceutical Society, died at Birmingham on the 16th of March, 1866, aged 69 years. He manifested much interest in the movements which resulted in establishing the Pharmaceutical Society, and for some years was one of its Council. He was always ready to take part in promoting pharmaceutical progress until precluded by ill health during the latter years of his life, and leaves a character fair and bright among his associates.